

FIG. 1

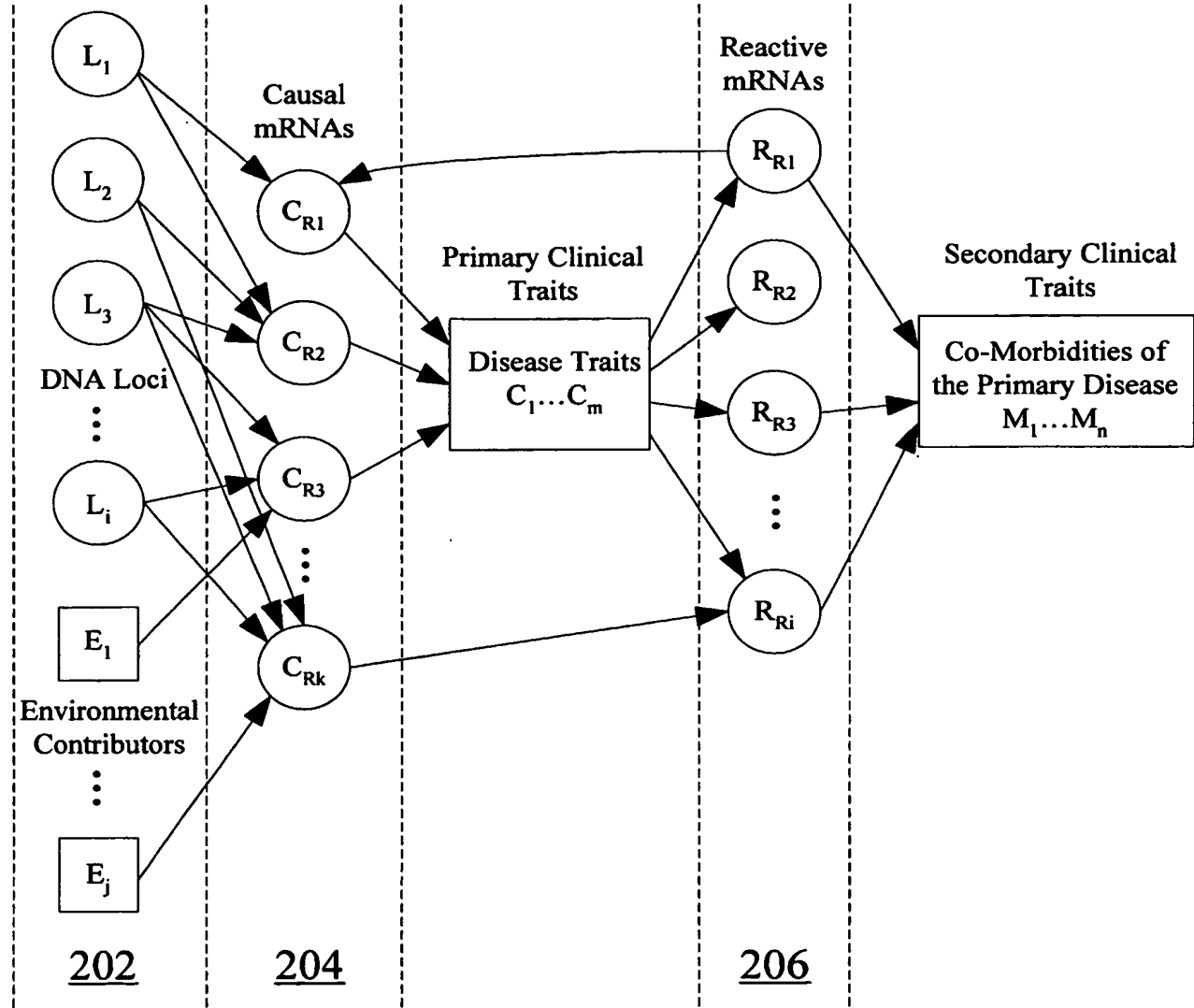


Fig. 2

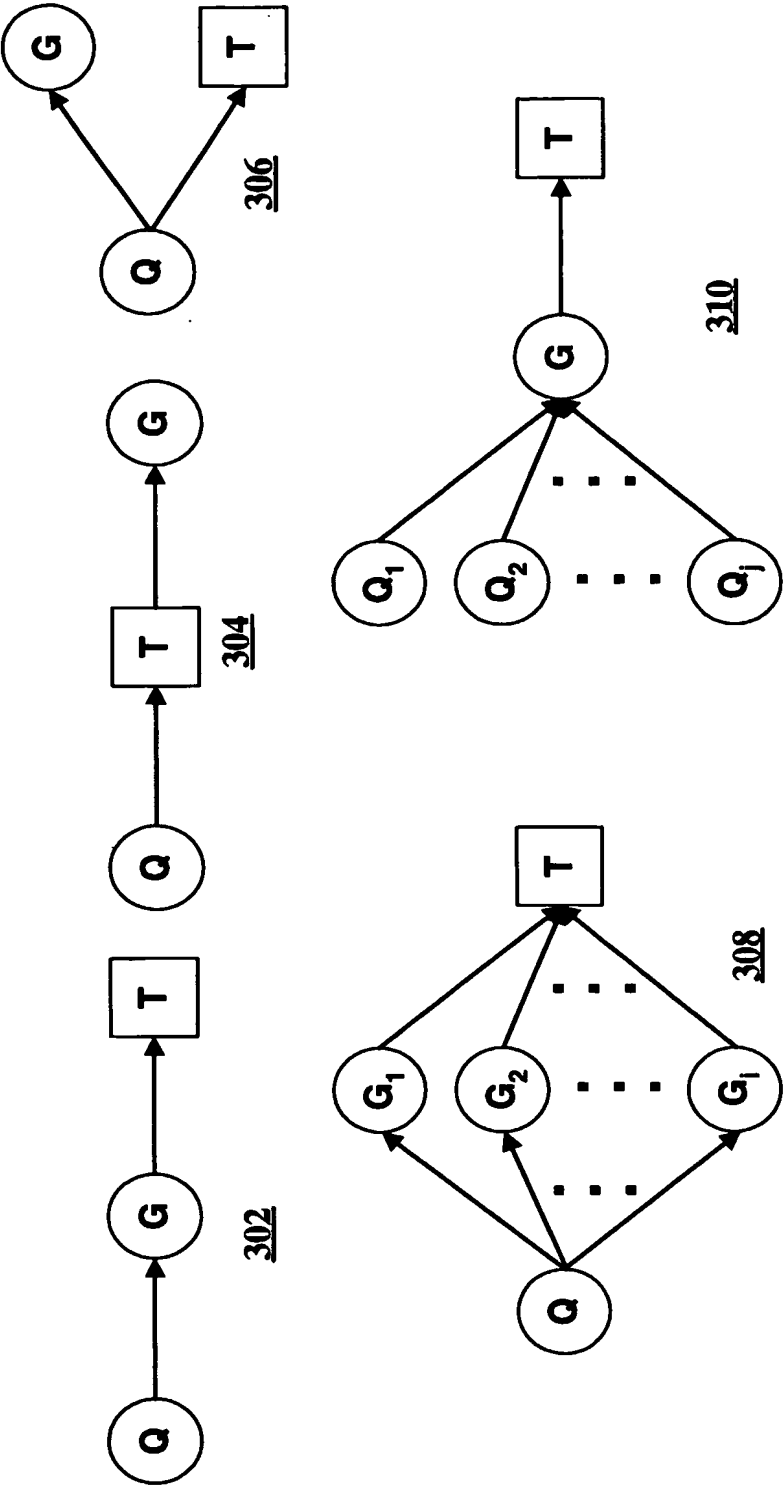
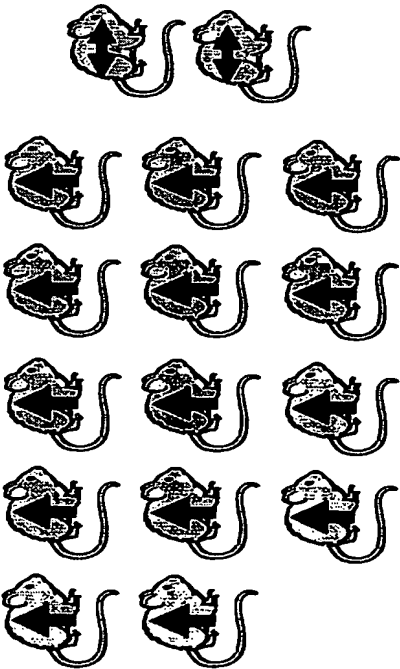


Fig 3A
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Genotype BB



Genotype AA

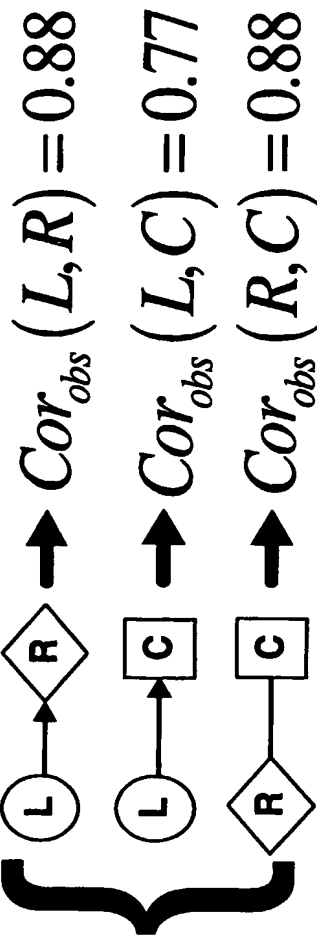
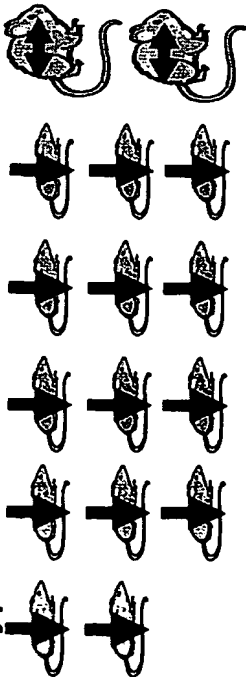


Figure 3B

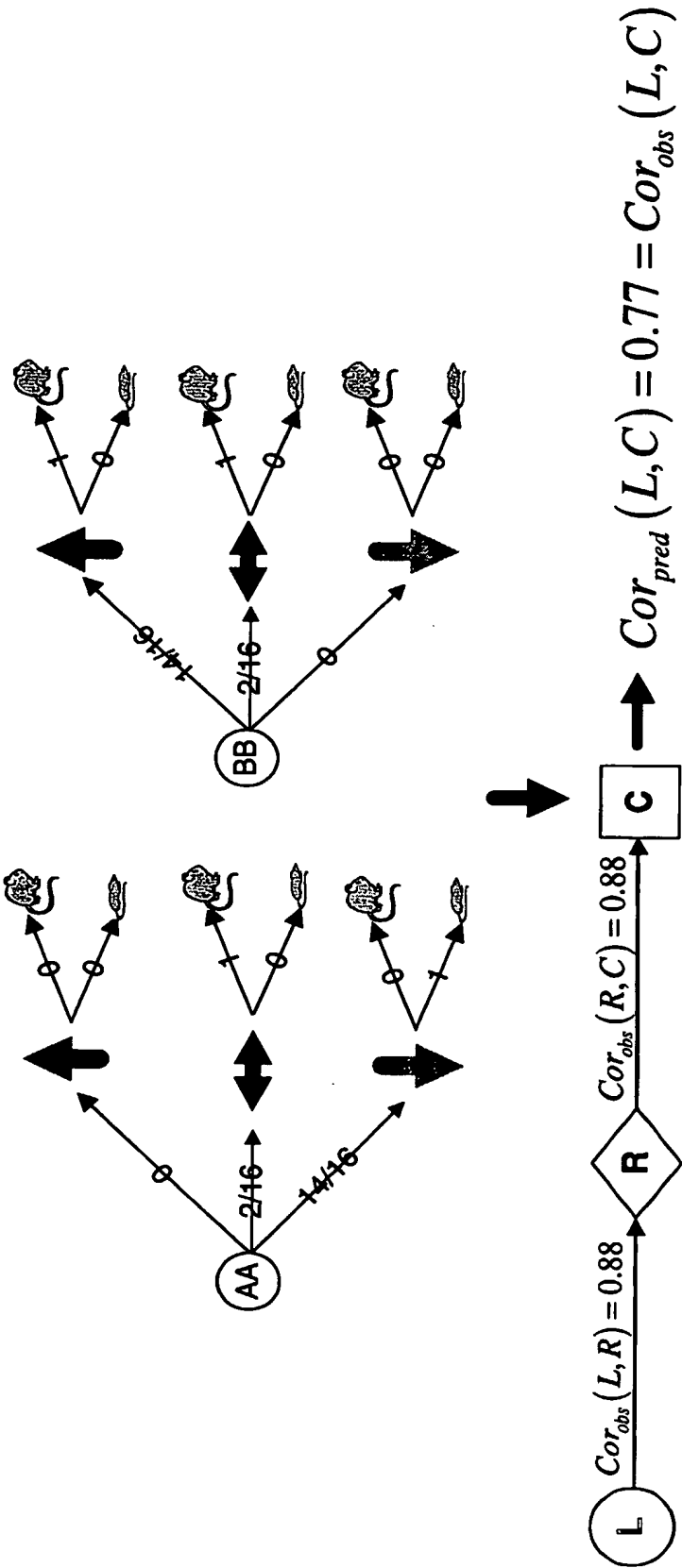


Figure 3C

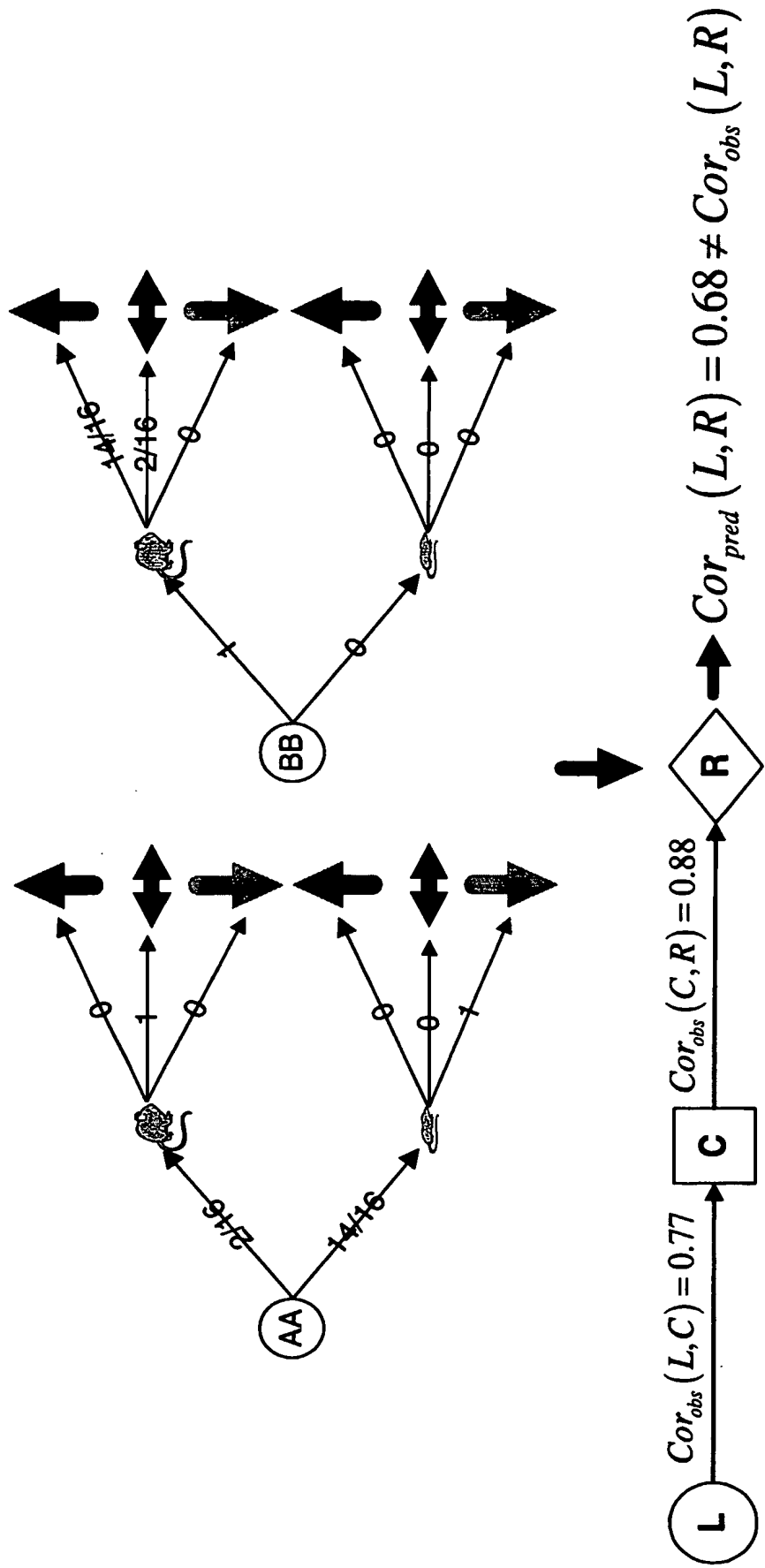


Figure 3D

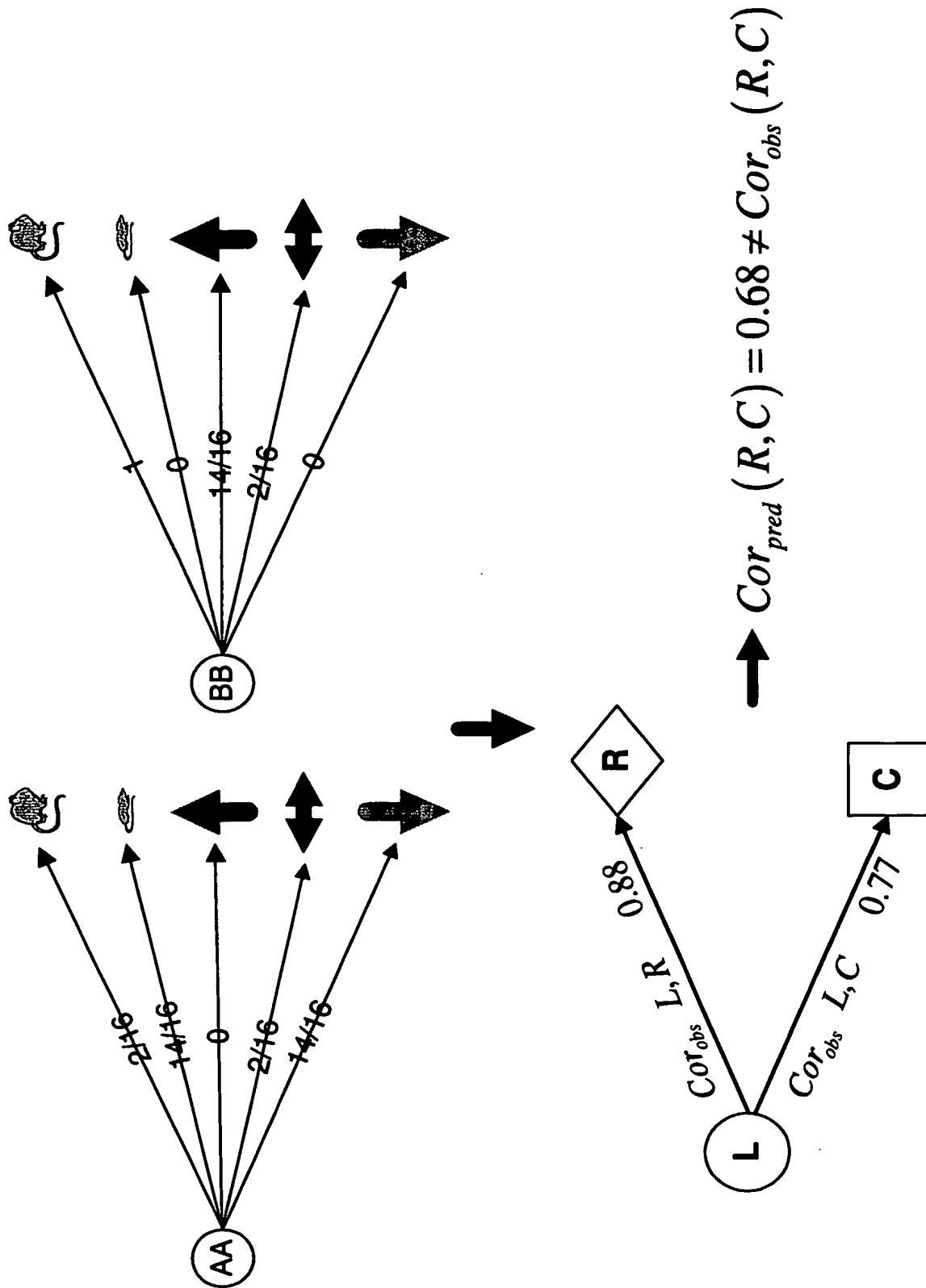


Figure 3E

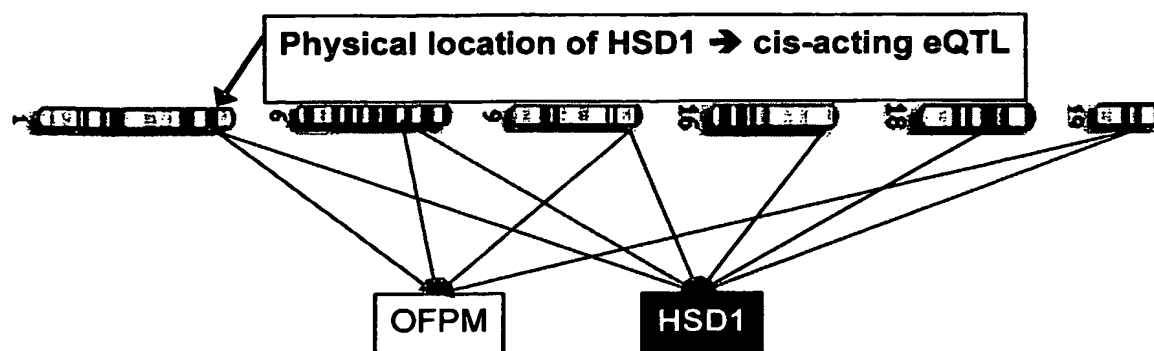


Fig. 4

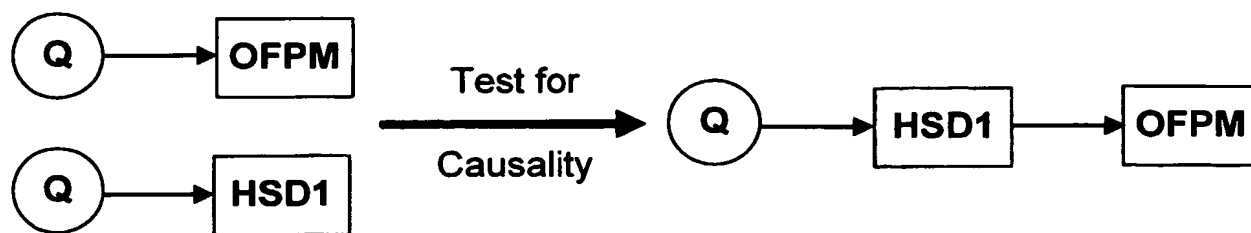


Fig. 5

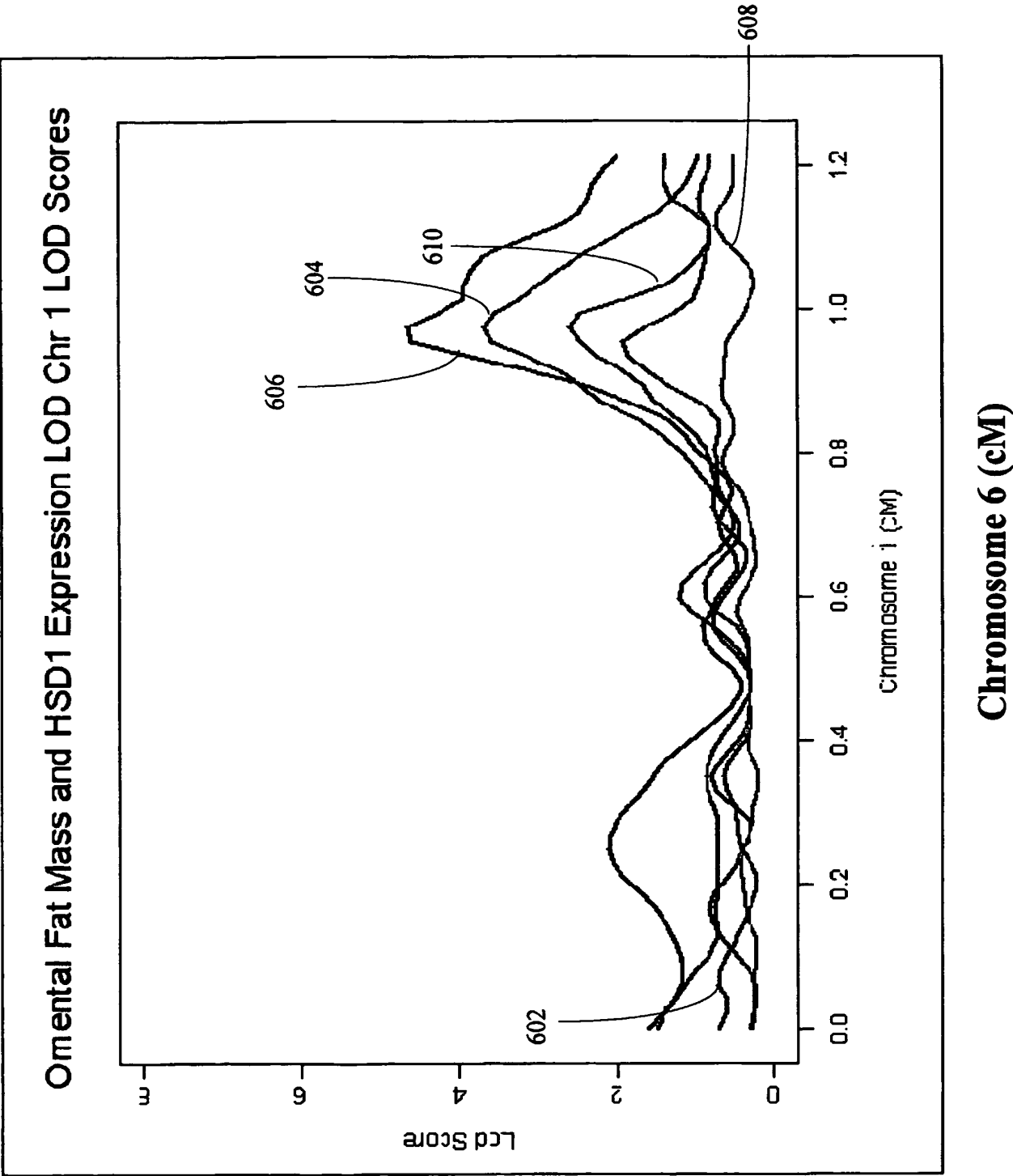


Fig. 6
9/60

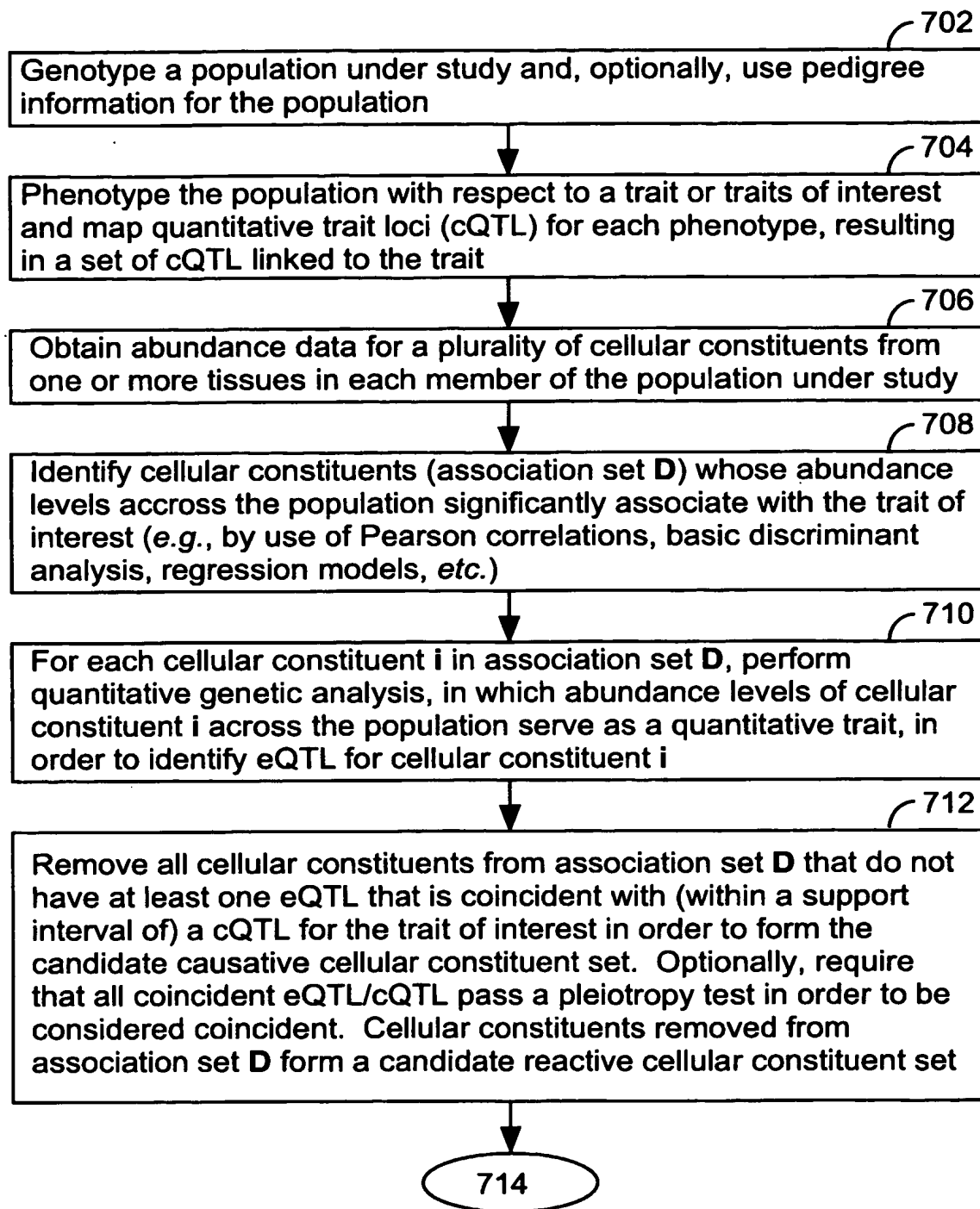


FIG. 7A

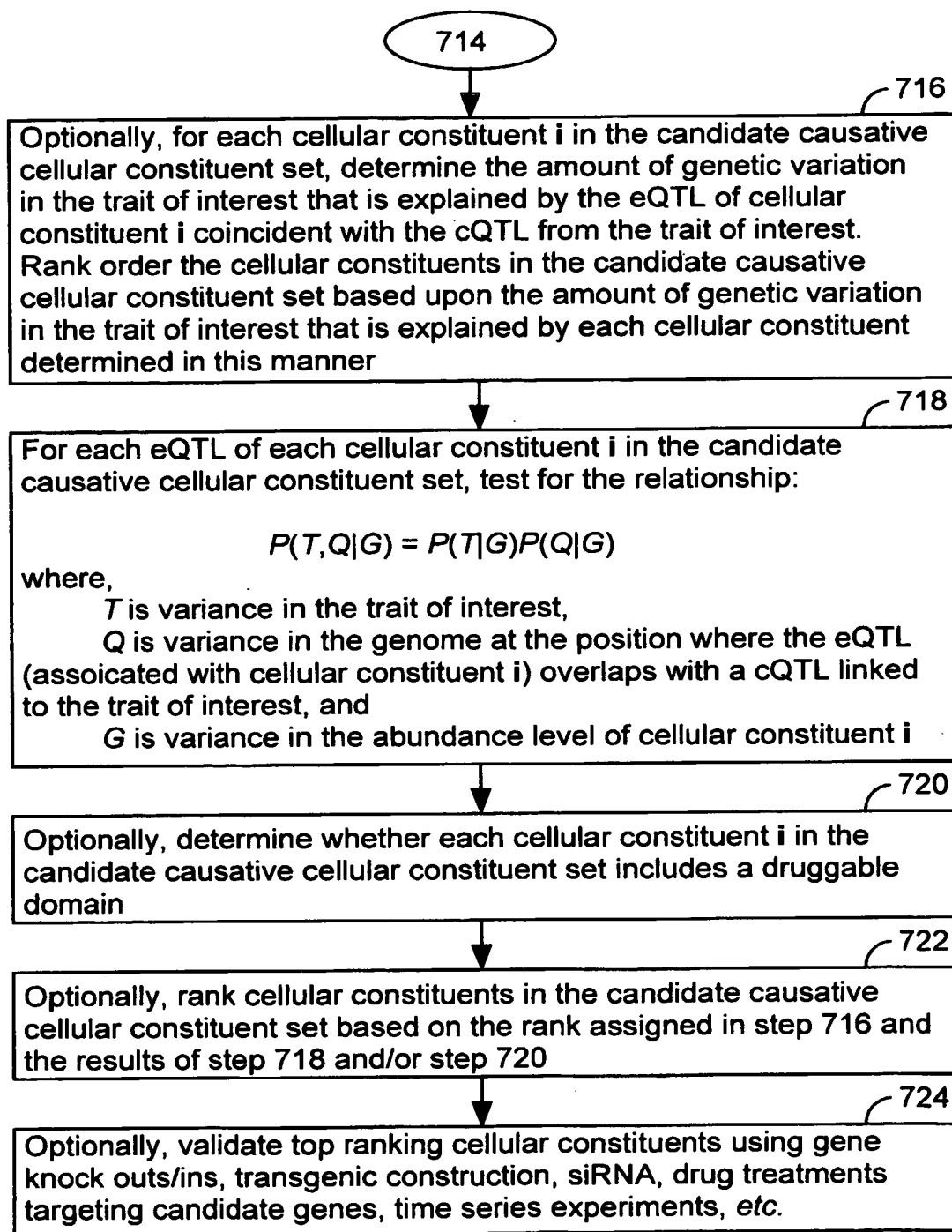
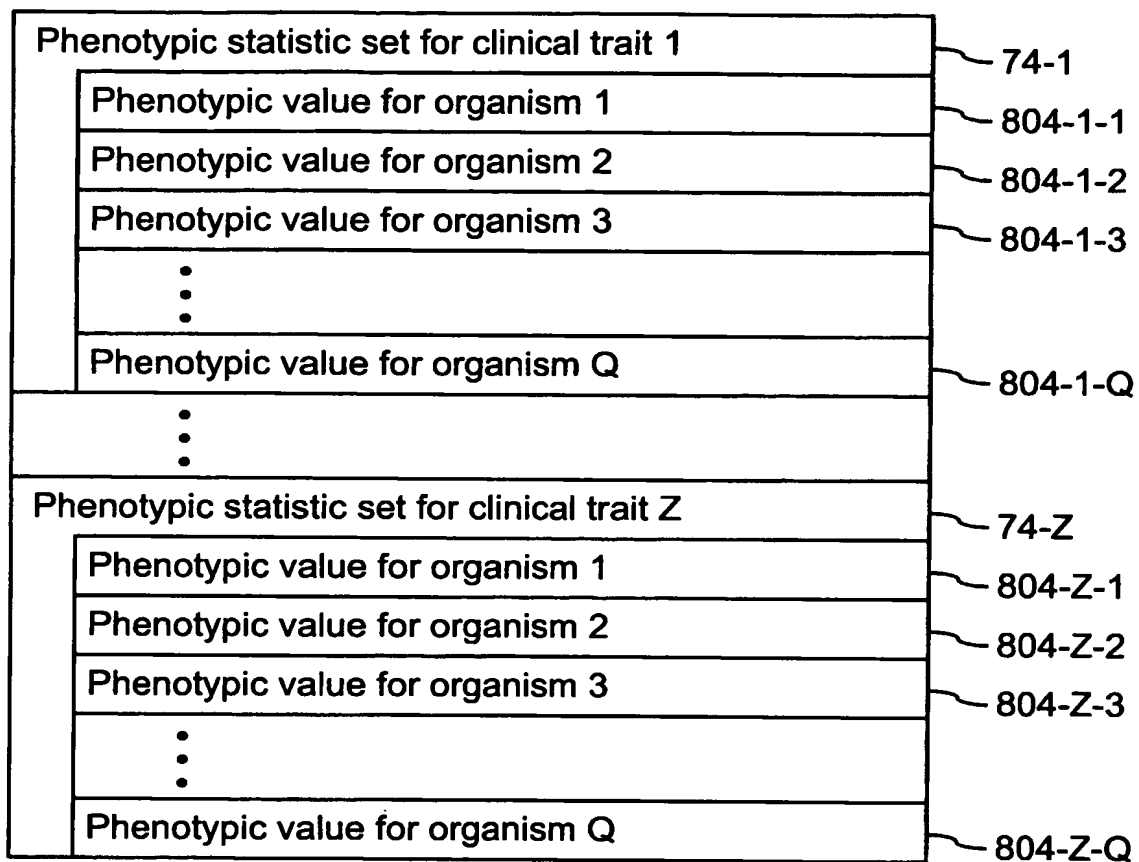


FIG. 7B

**FIG. 8**

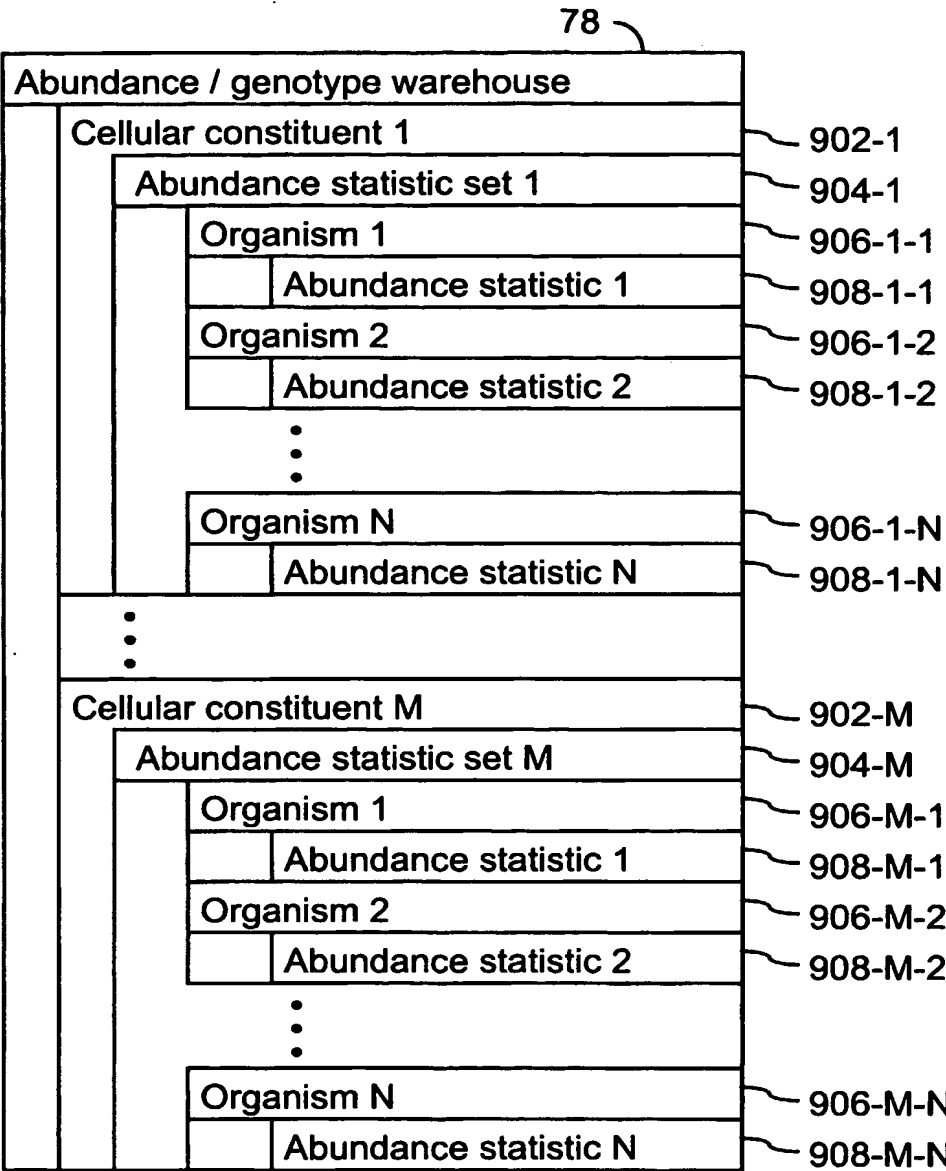
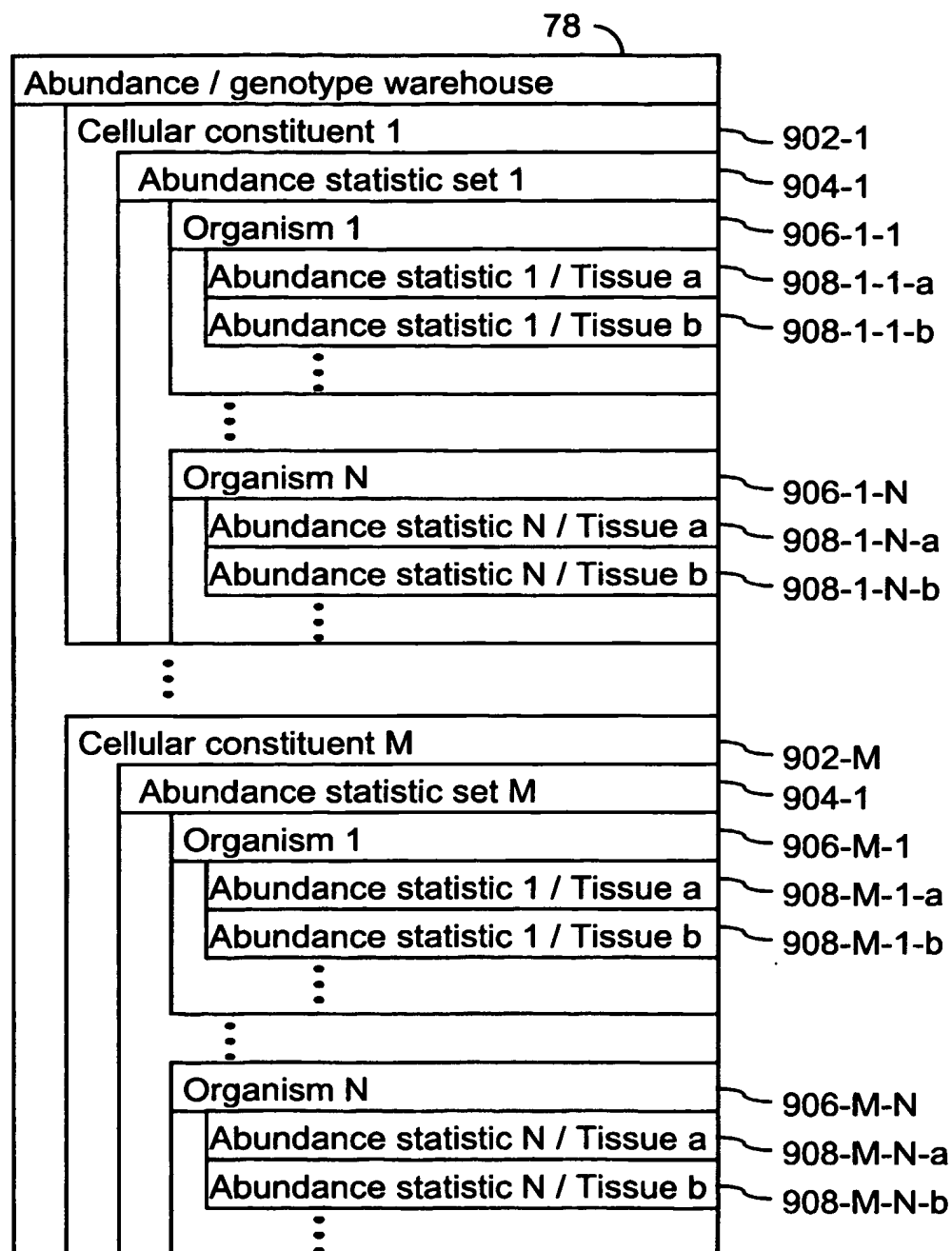


FIG. 9

904-G	
Abundance statistic for gene G from organism 1	908-G-1
Abundance statistic for gene G from organism 2	908-G-2
Abundance statistic for gene G from organism 3	908-G-3
Abundance statistic for gene G from organism 4	908-G-4
⋮	
Abundance statistic for gene G from organism N	908-G-N

FIG. 10

**FIG. 11**

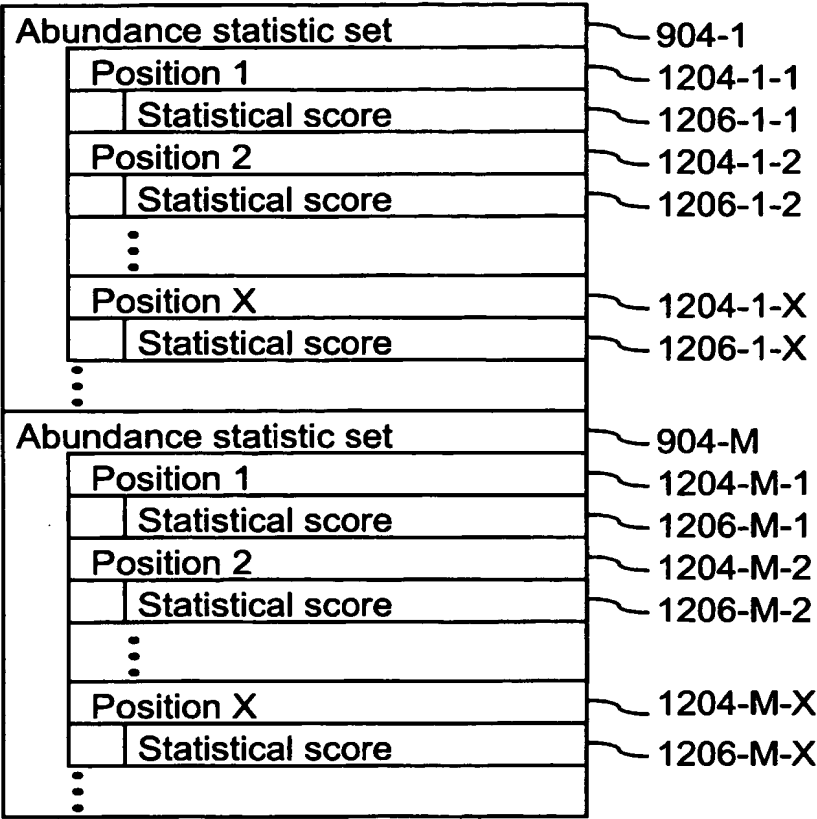
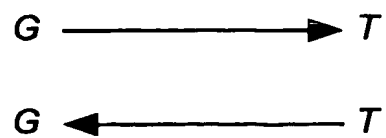
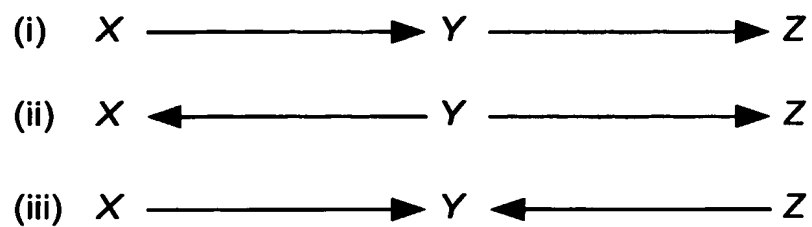
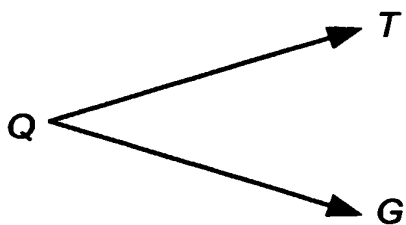


FIG. 12

**FIG. 13A****FIG. 13B****FIG. 13C**

**FIG. 13D****FIG. 13E**

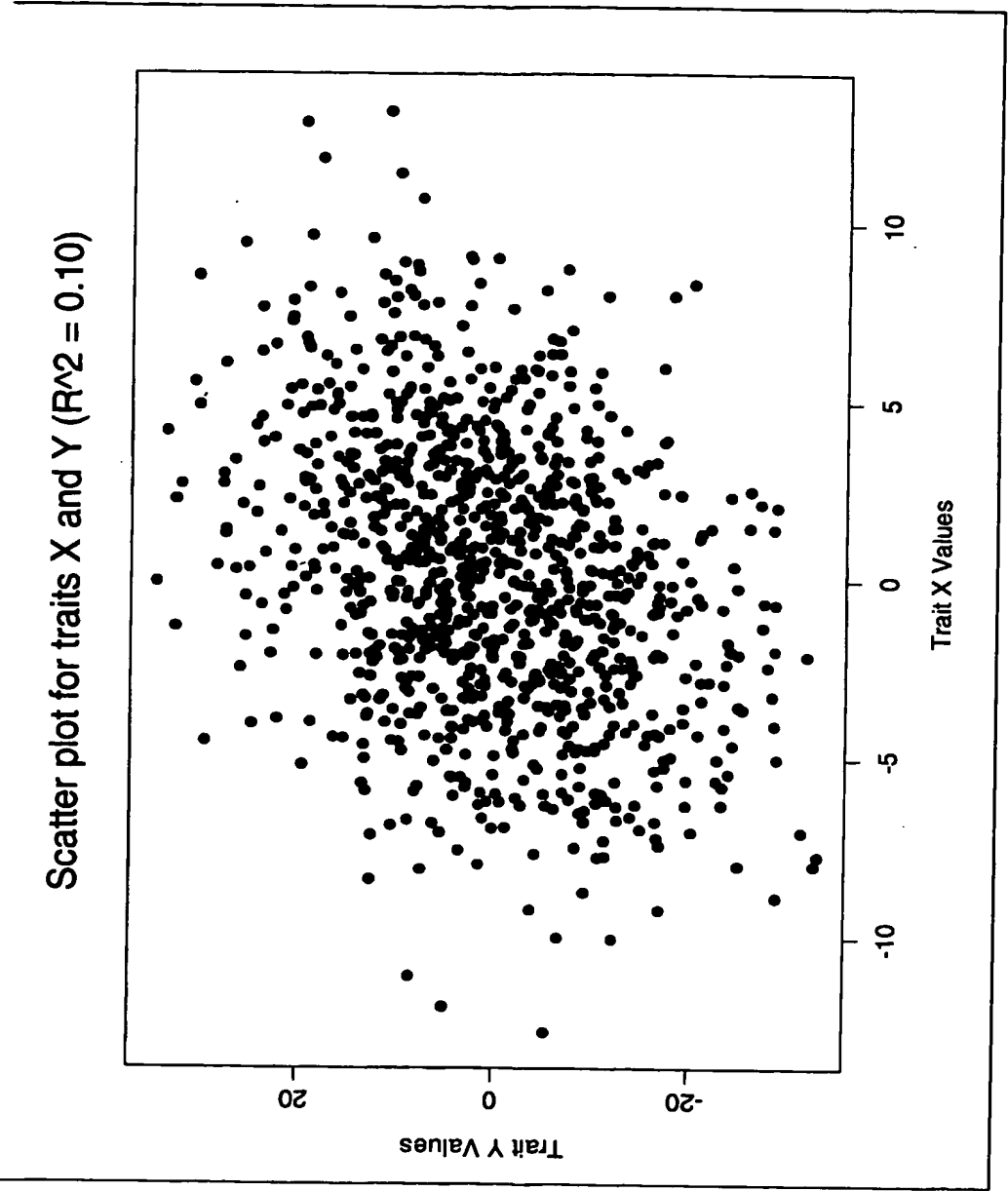


Fig. 14

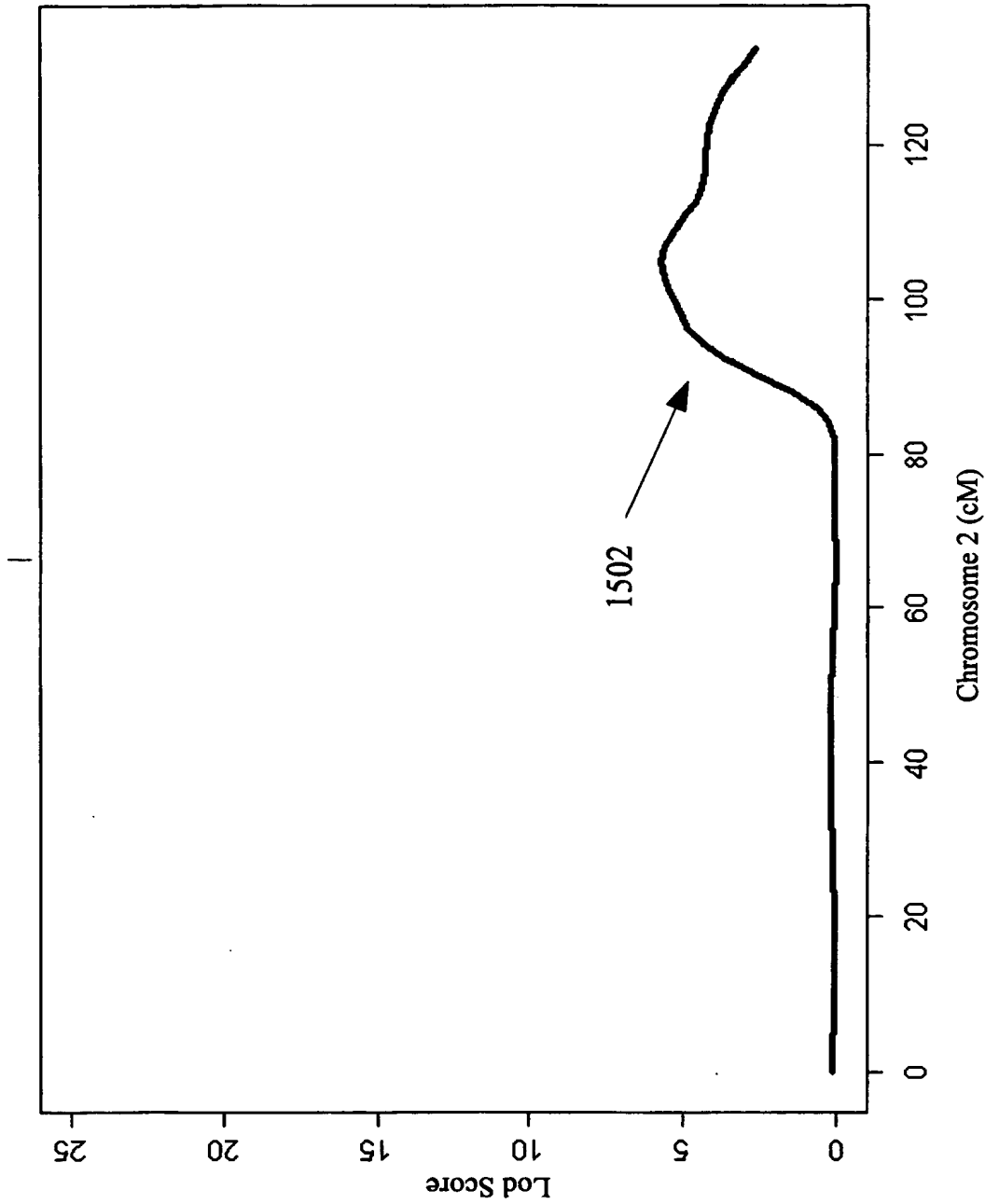


Fig. 15A

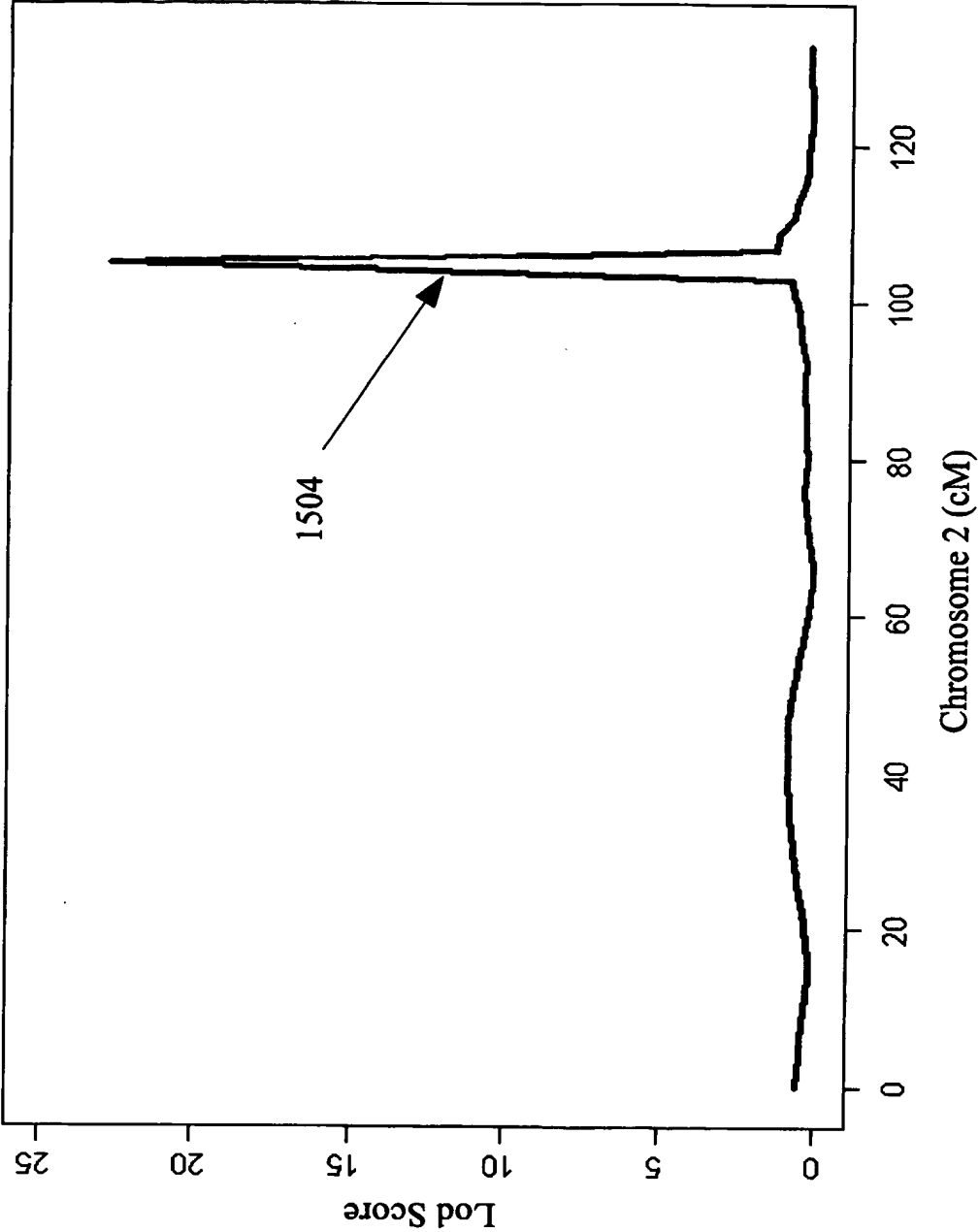


Fig. 15B

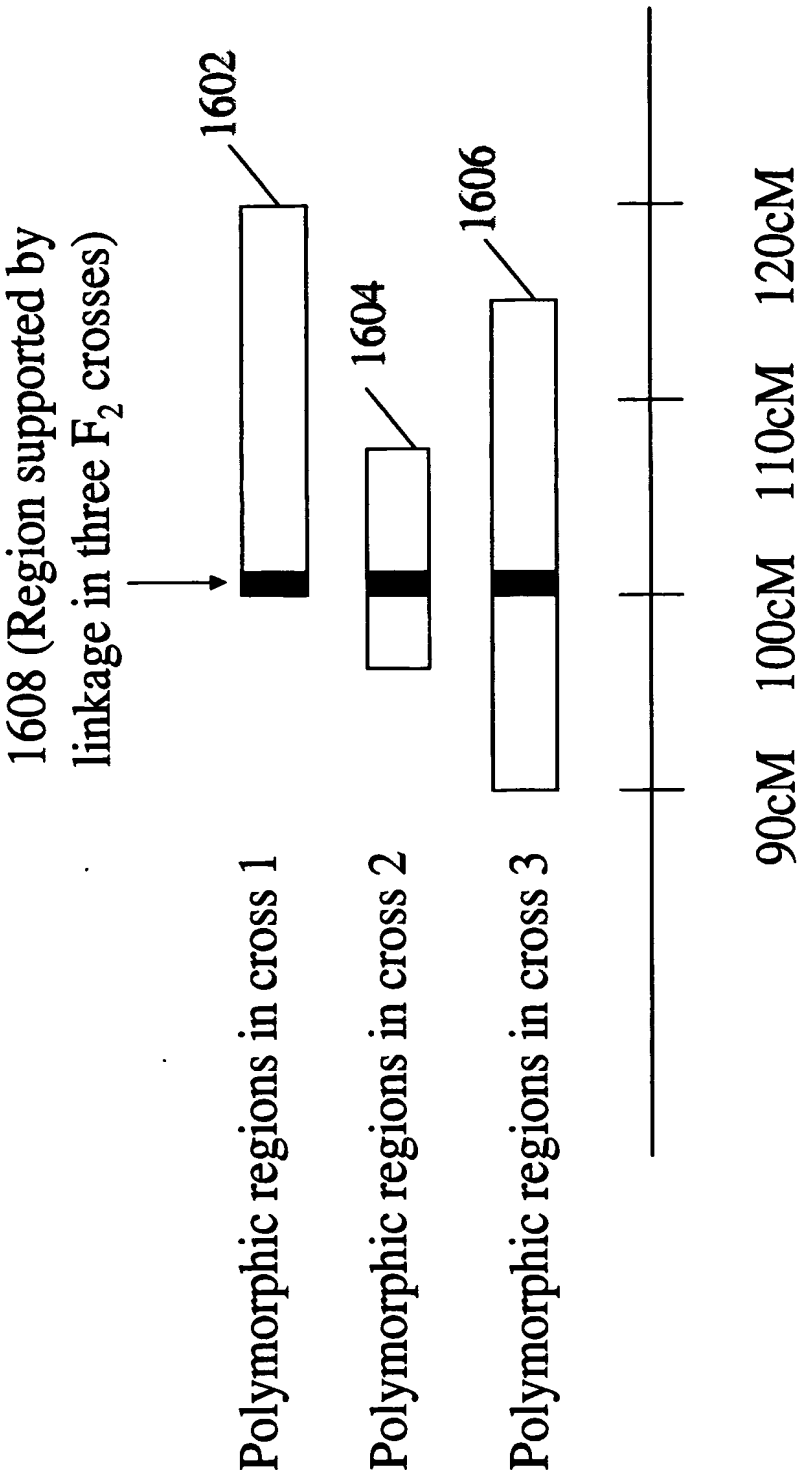


Fig. 16

10	20	30	40	50	60
MEPEAPRRRH	THQRGYLLTR	NPHLNKDLAF	TLERQQLNI	HGLLPPSFNS	QEIQVLRVVK
70	80	90	100	110	120
NFEHLNSDFD	RYLLMLDLQD	RNEKLFYRVL	TSDIEKFMPI	VYTPTVGLAC	QQYSLVFRKP
130	140	150	160	170	180
RGLFITIHDR	GHIASVLNAW	PEDVIKAIVV	TDGERILGLG	DLGCNGMGIP	VGKLALYTAC
190	200	210	220	230	240
GGMNPQECLP	VILDVGTENE	ELLKDPLYIG	LRQRRVRGSE	YDDFLDEFME	AVSSKYGMNC
250	260	270	280	290	300
LIQFEDFANV	NAFRLLNKYR	NQYCTFNDDI	QGTASVAVAG	LLAALRITKN	KLSDQTILFQ
310	320	330	340	350	360
GAGEAALGIA	HLIVMALEKE	GLPKEKAIKK	IWLVDKGLI	VKGRASLTQE	KEKFAHEHEE
370	380	390	400	410	420
MKNLEAIVQE	IKPTALIGVA	AIGGAFSEQI	LKDMAAFNER	PIIFALSNPT	SKAECSAEQC
430	440	450	460	470	480
YKITKGRAIF	ASGSPFDPVT	LPNGQTLYPG	QGNNSYVFPG	VALGVVACGL	RQITDNIFLT
490	500	510	520	530	540
TAEVIAQQVS	DKHLEEGRLY	PPLNTIRDVS	LKIAEKIVKD	AYQEKTATVY	PEPQNKEAFV
550	560	570			
RSQMYSTDYD	QILPDCYSWP	EEVQKIQTKV	DQ		

(SEQ ID NO: 1)

Fig. 17

10	20	30	40	50	60
MEPRAPRRRH	THQRGYLLTR	DPHLNKDLAF	TLERQQLNI	HGLLPPCIIS	QELQVLRIK
70	80	90	100	110	120
NFERLNSDFD	RYLLMLDLQD	RNEKLFYSVL	MSDVEKFMPI	VYTPTVGLAC	QQYSLAFRKP
130	140	150	160	170	180
RGLFISIHDK	GHIASVLNAW	PEDVVKAIVV	TDGERILGLG	DLGCNGMGIP	VGKLALYTAC
190	200	210	220	230	240
GGVNPQQCLP	ITLDVGTENE	ELLKDPLYIG	LRHRRVRGPE	YDAFLDEFME	AASSKYGMNC
250	260	270	280	290	300
LIQFEDFANR	NAFRLLNKYR	NKYCTFNDDI	QGTASVAVAG	LLAALRITKN	KLSDQTVLFQ
310	320	330	340	350	360
GAGEAALGIA	HLVVMAMEKE	GLSKENARKK	IWLVDKGLI	VKGRASLTEE	KEVFAHEHEE
370	380	390	400	410	420
MKNLEAIVQK	IKPTALIGVA	AIGGAFTEQI	LKDMAAFNER	PIIFALSSPT	SKAECSADEC
430	440	450	460	470	480
YKVTKGRAIF	ASGSPFDPVT	LPDGRTLFPG	QGNNSYVFPG	VALGVVACGL	RHIDDKVFLT
490	500	510	520	530	540
TREVISQQVS	DKHLQEGRLY	PPLNTIRGVS	LKIAVKIVQD	AYKEKMATVY	PEPQNKEEFV
550	560	570			
SSQMYSTNYD	QILPDCYPWP	AEVQKIQTKV	NQ		

(SEQ ID NO: 2)

Fig. 18

A.

logomen QTLs			Mod1 QTLs		
Chr	Pos (M)	LOD	Chr	Pos (M)	LOD
1	1.12	1.62	6	0.42	4.45
3	0.92	1.59	9	0.10	5.56
5	0.00	1.93	13	1.02	3.91
6	0.47	2.84	16	0.00	3.16
9	0.08	2.53	17	0.57	2.17
19	0.18	1.60	19	0.22	2.00

Fig. 19A

B.

No. of Trait overlaps with Mod1		No. of Trait overlaps with Mod1	
logomen	3	sqrtretrog	2
epipa	2	fatbw	1
ftpsum	2	livebwt	1
lep	2	omen	1
logftpsum	2	subc	1
logsubc	2	ins	0
sqrtlepipa	2	retrog	0
sqrtlep	2		

Fig. 19B

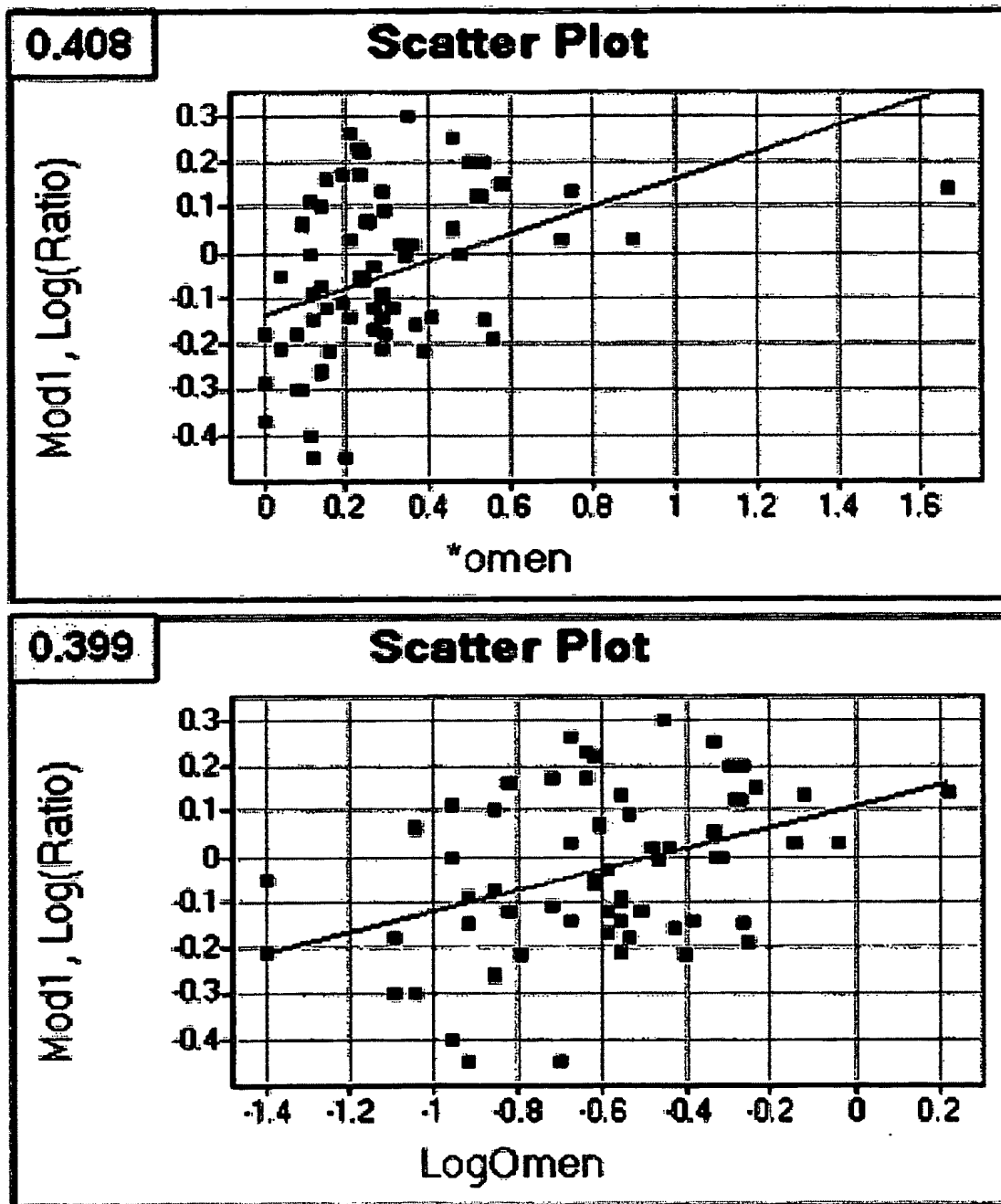


Fig. 20

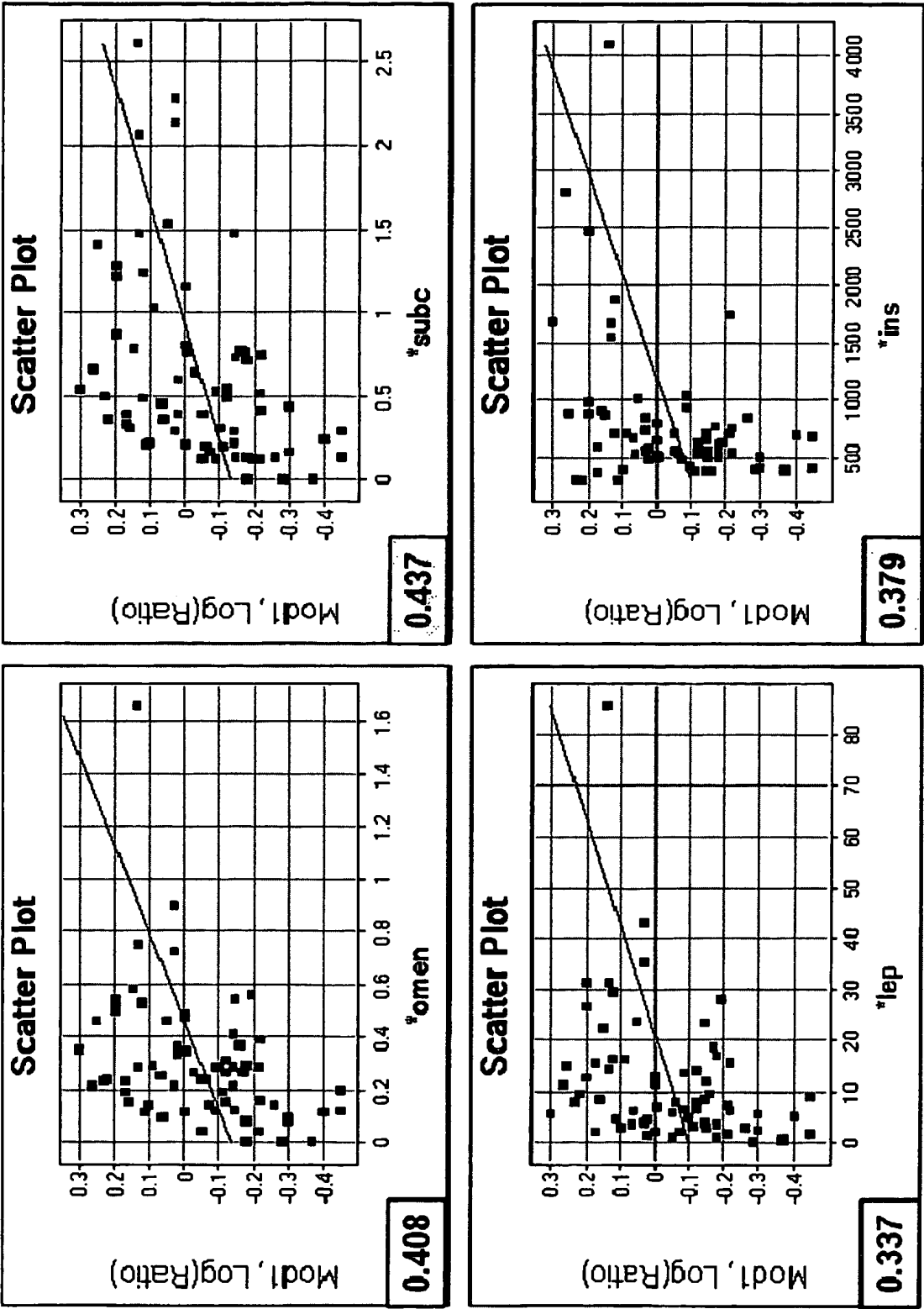


Figure 21

	*livebwt	*retrog	*epipa	*omen	*subc	*ftpsum	*fatbw	*lep	Mod1
*livebwt	1	0.56	0.65	0.64	0.62	0.67	0.43	0.67	0.23
*retrog		1	0.77	0.78	0.75	0.82	0.78	0.76	0.49
*epipa			1	0.89	0.86	0.99	0.91	0.94	0.36
*omen				1	0.84	0.92	0.82	0.92	0.41
*subc					1	0.92	0.87	0.85	0.44
*ftpsum						1	0.92	0.95	0.41
*fatbw							1	0.82	0.45
*lep								1	0.34
Mod1									1

Figure 22

1 IKEKGKPLXL NPRTNKGXAF TLQERQXLGL QGLLPPKIET QDIQALRFHR
51 NLKKXTSPLE KYIYIXGIQE RNEKLFYRIL QDDIESLXPI VYTPTVGLAC
101 SQYGHIFRRP KGLFISISDR GHVRSIVDNW PENHVKAVVV TDGERILGLG
151 DLGVYGXGIP VGKLCLYTAC AGIRPDRCPL VCIDVGTDNI ALLKDPFYXG
201 LYQKRDRTOQ YDDLIDEFXK AITDRYGRNT LIQFEDFGNH NAFRFLRKYR
251 EKYCTFNDDI QGTAVALAG LLAAQKVISK PISEHKILFL GAGEAALGIA
301 NLIVXSXVEN GLSEQEAQKK IWFXDKYGLL VKGRKAKIDS YQEPFTHSAP
351 ESIPDTFEDA VNILKPSTII GVAGAGRLFT PDVIRAXASI NERPVIKALS
401 NPTAQAECTA EEAYTLTEGR CLFASGSPFG PVKLTGGRVF TPGQGNNVYI
451 FPGVALAVIL CNTRHISDSV FLEAAKALTS QLTDEELAQG RLYPPLANIQ
501 EVSINIAIKV TEYLYANKXA FRYPEPEDKA KYVKERTWRS EYDSLLPDVY
551 EWPESSASSPP VITE

(SEQ ID NO: 3)

Fig. 23

10	20	30	40	50	60
MLSRLRVVST	TCTLACRHLH	IKEKGKPLML	NPRTNKGMAF	TLQERQMLGL	QGLLPPKIET
70	80	90	100	110	120
QDIQALRFHR	NLKKMTSPLE	KYIYIMGIQE	RNEKLFYRIL	QDDIESLMPI	VYTPTVGLAC
130	140	150	160	170	180
SQYGHIFRRP	KGLFISISDR	GHVRSIVDNW	PENHVKAVVV	TDGERILGLG	DLGVYGMGIP
190	200	210	220	230	240
VGKLCLYTAC	AGIRPDRCLP	VCIDVGTDNI	ALLKDPFYM	LYQKRDRTQQ	YDDLIDEFMK
250	260	270	280	290	300
AITDRYGRNT	LIQFEDFGNH	NAFRFLRKYR	EKYCTFNDDI	QGTAVALAG	LLAAQKVISK
310	320	330	340	350	360
PISEHKILFL	GAGEAALGIA	NLIVMSMVEN	GLSEQEAQKK	IWMFDKYGLL	VKGRKAKIDS
370	380	390	400	410	420
YQEPFTHSAP	ESIPDTFEDA	VNILKPSTII	GVAGAGRLFT	PDVIRAMASI	NERPVIFALS
430	440	450	460	470	480
NPTAQAECTA	EEAYTLTEGR	CLFASGSPFG	PVKLTDGRVF	TPGQGNNVYI	FPGVALAVIL
490	500	510	520	530	540
CNTRHISDSV	FLEAAKALTS	QLTDEELAQG	RLYPPLANIQ	EVSINIAIKV	TEYLYANKMA
550	560	570	580		
FRYPEPEDKA	KYVKERTWRS	EYDSLPLPDVY	EWPEASSPP	VITE	

(SEQ ID NO: 4)

Fig. 24

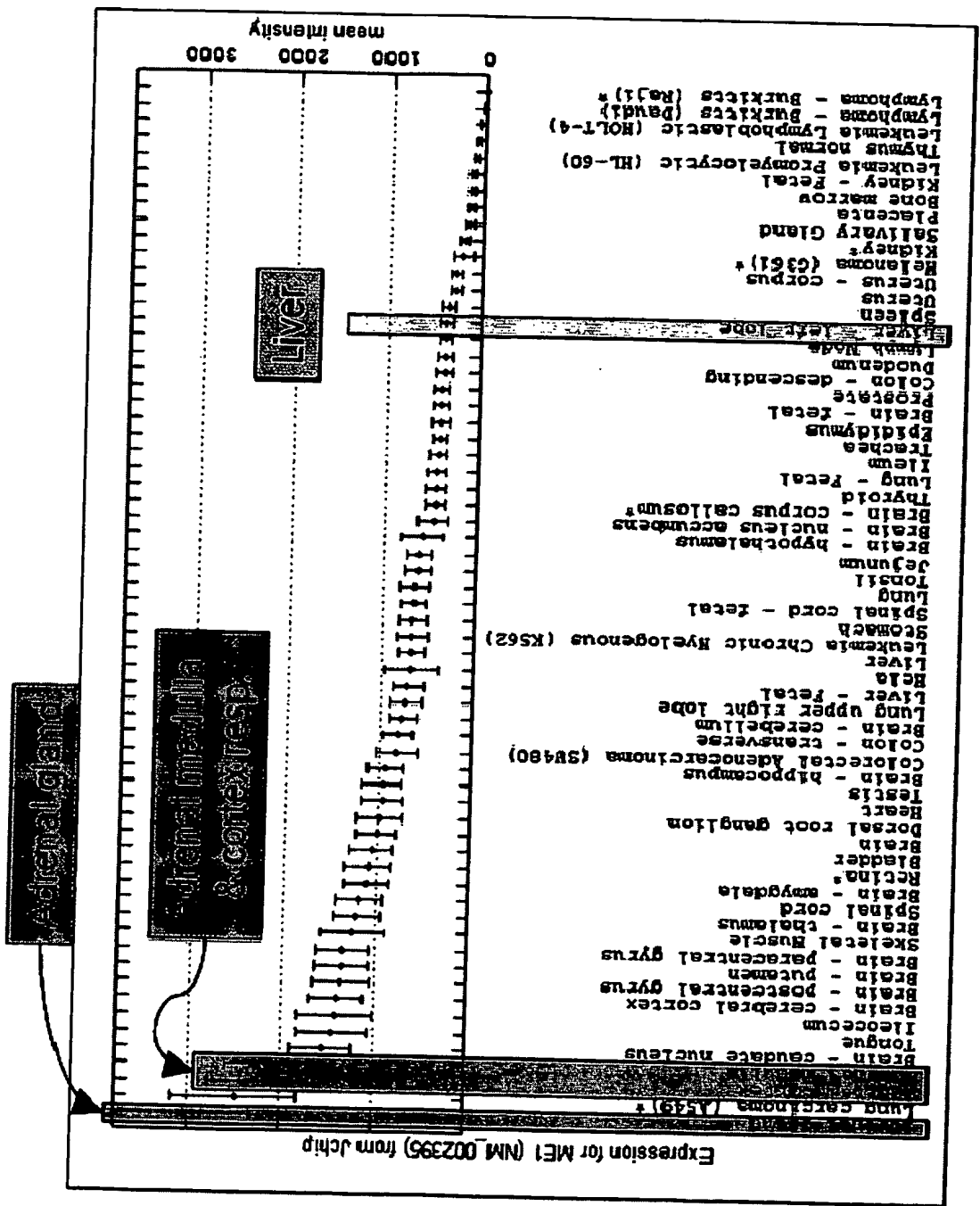


Fig. 25

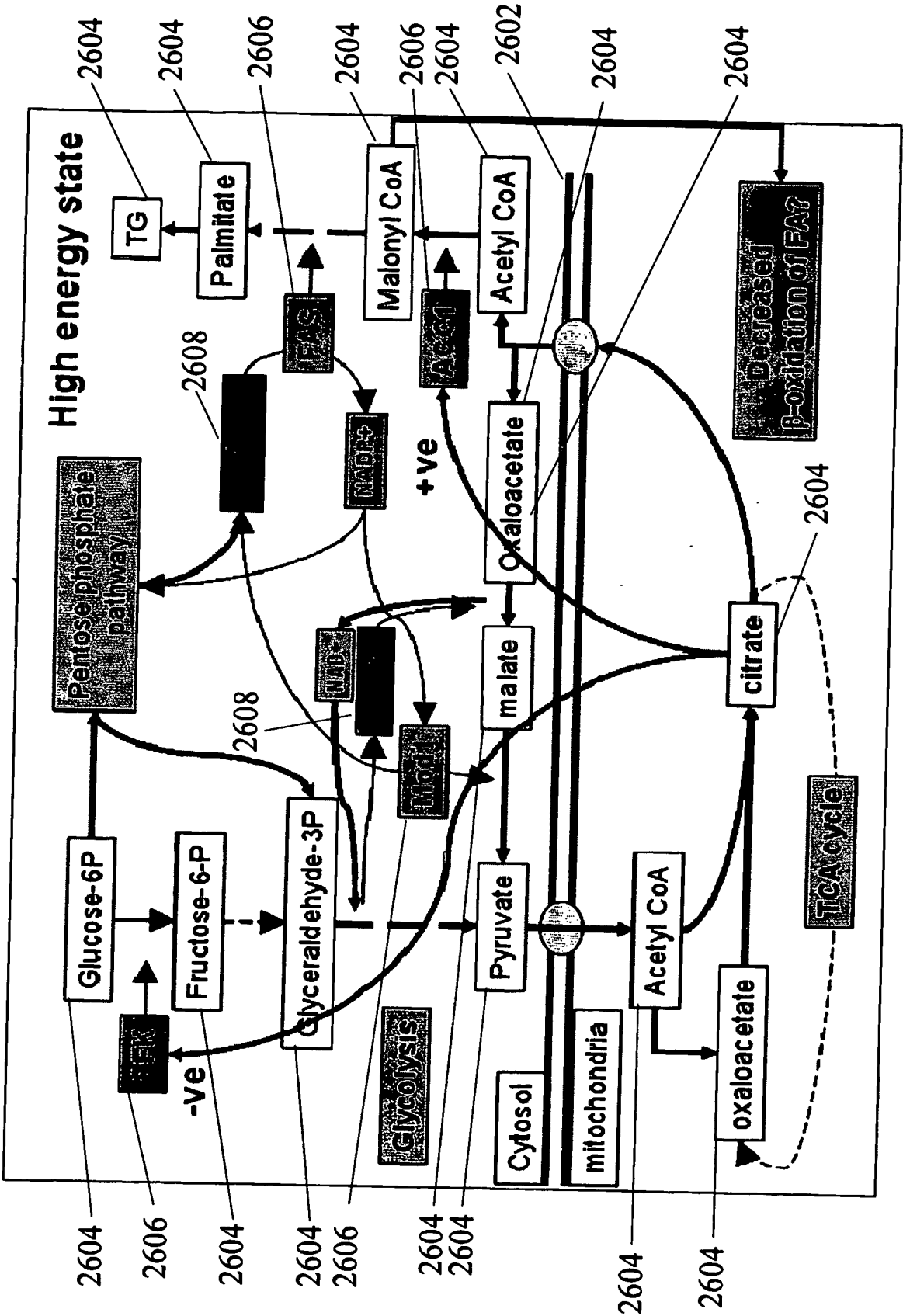


Fig. 26

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121 gacctggaca agtacatcat tctcatgaca ctccaagacc gtaacgagaa gctcttctac
181 cgagtgctga cttcggacgt ggagaagttc atgccaatcg tgtacacgcc taccgtgggg
241 ctagcctgtc agcactatgg cctgactttc cgcaggcccc gtggactggt catcaccatt
301 catgacaaag gtcactcttc aacaatgctg aattcttggc cagaagacaa tattaaggcc
361 gtggtggtga ctgatgggga gcgcacctcg ggccctggag acctgggctg ctacggcatg
421 ggcatccctg tgggcaagct ggccctgtac acggcatgcg gaggggtgaa cccgcagcag
481 tgcctccctg tgctgctgga cgctggcacc aacaatgagg agctgctcag agaccctctg
541 tacatgggcc tgaaacacca gcgcgtgcac gggaaggcat acgatgactt gctggatgag
601 ttcatgcagg ctgtgacaga caagtttggg ataaattgcc tcatccaatt tgaagacttc
661 gccaatgcca atgccttccg cctgctcaac aaataccgta acaagtactg catgttcaat
721 gatgacatcc aagatgactt ctccagaggc ccaaagaggt cacaactttt cttcaagtga

(SEQ ID NO: 5)

Fig. 27

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1  atgttggtccg  gggttaagcgt  agtttccacc  acttggtactt  tggcatgtct  acattttacac
61  ataaaagaaa  aaggcaagcc  acttatgctg  aatccaagaa  caaacaaggg  aatggcattt
121 actttacaag  aacgacagat  gcttggtctt  caagggcttc  tacctcccca  aatacagaca
181 taagatatct  aagccttacg  attccataga  aacttgaaaa  aaatgactag  cccttcggaa
241 aactatatct  acataatggg  aatacaagaa  agaaatgata  aattgtttta  tagaatactg
301 caagatgaca  cggagagttt  aatgccaat  gcatatacac  cgacggttgg  tcttgctgc
361 tcccagtgtg  gacacctctt  tagaagacct  aagggtattat  ttatttccat  ctcagacaga
421 ggtcatgtta  gatcaattgt  ggataagtgg  ccagaaaatc  atgttaaggc  tgttttagtg
481 actgatggag  agagaattct  gggcatgga  gatctgggtg  tctatggaat  gggaattcca
541 gtaggaaaaa  tttgtttgta  tacagtttgt  ccaggaatat  ggcctgatag  atgccttctg
601 gtgtgtattg  atgtgggagc  tgataatatc  gcactcttaa  aaggcacatt  ttacatgggc
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721 gctattactg  acagatatgg  ctggaacaca  ctcttcagt  ttgaagggtt  tggacatcat
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841 caagggacag  ctgcagtagc  tctaataagg  ctcttgcaa  cacaaaaagt  tactagtaaa
901 ccaatctccg  aacacaaaat  cttattcctt  ggagcaggag  agattactct  tagaattgca
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1021 atctggatgt  ttgacaagta  tggtttatta  gtttaggggc  agaaagcaaa  aatagattgt
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1141 gtgaatataa  tgaagacttc  aactacaatt  ggagttgcag  gtgctggccg  tcttttact
1201 cctgatgtaa  tcagagccat  tggctgtatc  aatgaaaggc  ctgtaatat  tgcattaagt
1261 aatcctacag  cacaggcgga  gtgcaggagt  tgcacggctg  gagaagcata  tacacttaca
1321 gagggcaaat  gtttggttgc  cagtggcagt  ccatttgggc  cagtgaaact  cacagatggg
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1501 ttgacaagcc  acgtgacgga  tgacgcgcta  gcccgaggga  gactttactt  accacttgct
1561 aatattcaga  aagtttctat  taacattgct  attaaagtta  cagaatacct  gtatgcta
1621 aaaatggctt  tctcaatacc  cagaacctga

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(SEQ ID NO: 6)

Fig. 28

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361 tcttttatag agtgctgaca tctgacattg agaaattcat gcctattgtt tatactccca
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541 tcaaggccat tgtggtgact gatggagagc gtattcttgg cttggggagac cttggctgta
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661 ctcaagaatg tctgcctgtc attctggatg tgggaaccga aaatgaggag ttacttaag
721 atccactcta cattggacta cggcagagaa gagtaagagg ttctgaatat gatgattttt
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841 aagattttgc caatgtgaat gcatttcgtc tcctgaacaa gtatcgaaac cagtattgca
901 cattcaatga tgatattcaa ggaacagcat ctgttgcatg tgcaggtctc cttgcagctc
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1081 agaaagccat caaaaagata tggctggttg attcaaaagg attaatagtt aagggacgtg
1141 cttccttaac acaagagaaa gagaagtgtt cccatgaaca tgaagaaatg aagaacctag
1201 aagccattgt tcaagaaata aaaccaactg ccctcatagg agttgctgca attgggtggtg
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1501 ttgtggcgtg tggattgagg cagatcacag ataataatctt cctcactact gctgagggtta
1561 tagctcagca agtgtcagat aaacacttgg aagagggtcg gctttatcct cctttgaata
1621 ccattagaga tgtttctctg aaaattgcag aaaagattgt gaaagatgca taccaagaaa
1681 agacagccac agtttatcct gaaccgcaaa acaagaagc atttgtccgc tccagatgt
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1861 gtctttaaac ctttcataat ttttaaagggt tggaatcttt tataatgatt cataagacac
1921 ttagattaag attttacttt aacagtctaa aaattgatag aagaatatcg atataaattg
1981 ggataaacat cacatgagac aattttgctt cactttgcct tctggttatt tatggtttct
2041 gtctgaatta ttctgcctac gttctcttta aaagctgttg tacgtactac ggagaaactc
2101 atcattttta tacaggacac taatgggaag accaaaatta ctaataaatt gaaataacca
2161 acattaaaac tcataattat tttgttgacc attttggttaa aatctacttt tc

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(SEQ ID NO: 7)

Fig. 29

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AAACTCTAATTTAAACATTTAATTCTTCAGAATTAATACACACAGATGCTATCATGGGGG
GGGGGAGGCGTGCAGCCCCCATCGGGACCGGGTTTTGACAACTTACTTACAACCTTTATTA
CATCCTTTTATTTACTGGTCCAGGCGCCGGAGCATGGAAAGATATACAGCGTGGAGTAAA
CACATTCATCCTGGGTGAGGAGTTCTGGCAGGAGACACTGCTTTTCAACATTAAAAATGT
ATAAGGTGTTTAGCAAAAGTTACAGAAAACGGACCAAATGAGCAAGTTTATTTTGTTAGA
AAATTCCACTTTCGTGGGGTTCGCTGATGTGCTCGGGTTGCAAGGGAATGCTTCCGG

(SEQ ID NO: 8)

Fig. 30

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1 gttgcagagc agtactgccg ggaacaagaa actgcagcgg gcgctagagg ggccggacctg
61 aggtcgcgga ttccgaagcc cccgaggcag attccgagtg cagtgggtag gaggctgtcc
121 tccgggcctc gccgaccatc ctgcccagcg actgggcgtg gccggaggaa ctgtcccga
181 gctgtggggc ctttcatttg gccttgggaa gagcagcagg agaaggcggg gtcctcccc
241 acgtttcggc cgaagtggct gcagagctga aggggtgggg cctcggggta gcccggtgag
301 tggatcctgt cctctctcct cagccctgga ccatagccag cacacactga ggcaggaatg
361 gccccgagac ctccgacggc caagccccag gagtcggtga cattcaaaga tgtggctgtg
421 aacttcaccc aggaagaatg gcaccacgtg ggccctgccc agaggagctt atacagggat
481 gtcagtctgg agaactacaa ccacctggtg tcgctcgggt atcaagtctc caagccagag
541 gtgatcttca aattggagca aggagaagag ccatggatat cagagaaaaga aatccaaaga
601 cctttctgtc cagactggaa gaccaggcct gagtcctcac ggagtcctca gcagggcgta
661 tctgaagtat tcctcagaac aaatgtttta tcacacacca caataggtga tatctggaat
721 gtcgctatcc aggggcatca ggaaagtggg agaagacatc tggggccaga gcatccttc
781 cagaagaaaa taaccactct agagaaaaaa attgagcaaa acaaagtgtg tgaagactct
841 agtttgagca cagacttggg tccacaactg gacatttctt caagtataag gcccagtgc
901 tgtaaaacat ttggaaataa tttggaacac aattcagaac tagttactca gagtaatatc
961 cttgctaaaa agaagcctta taagtgtgat aaatgtagga aatcatttat tcatagatca
1021 tcaacttaata aacacgagaa gattcataaa ggcgatcctt actccaatgg tacagaccaa
1081 ggagctcagt ctggaaggaa acaccatgag tgtgcccact gtgggaaaac cttcctctgg
1141 agaacacagc tcacggagca ccagagaatt cacactgggg aaaaaccctt tgagtgtaat
1201 gtgtgtggaa aggccttcag gcacagctcg tcccttgggt agcatgaaa cgcacataca
1261 ggagagaagc cctatcagtg tagcctctgt gggaaagcct tccagcgcag ttcactctt
1321 gttcaacacc agagaatcca cacgggagag aagccctatc gctgcaatct ctgtgggagg
1381 tcattcaggc acagcacgtc cctcacgcaa catgaggtga cccacagtgg ggagaaaccc
1441 ttccagtgtg aggaatgtgg gaaggccttt agcaggtgtt cttcccttgt ccagcatgag
1501 aggaccata caggagagaa gcctttcgag tgcagcattt gtgggagggc atttggtcag
1561 agcccatccc ttataaaca tatgaggatt cataaaagaa gcaaaccctt ccaaagtaac
1621 aacttcagcc tggcttttgt gcctaacact cctcttcctc aaggtgaagg cctgcttact
1681 gaagtaaagt cgtaccattg taatgactgt gggaaagact tcggtcacat tacagacttc
1741 tctgagcacc agaggctcca cgctggggag aattcctacg gctctgaaca gaccttctt
1801 ggtcagcagt ccctgtctca tccccgagag aaaccctatc agtgcaacgt atgtgggaaa
1861 gcttttaaaa ggagtacaag ttttatagag catcatcgaa ttcacactgg agagaaaccc
1921 tatgaatgta atgagtgtgg ggaagccttc agtcgactct cgtcactcac gcaacacgag
1981 aggaccaca ctggcgagaa accctatgag tgcattgact gcgggaaagc cttcagtcaa
2041 agctcatccc tgattcagca cgaaaggacg cataccggag agaaacccta tgagtgtaat
2101 gagtgtgggc gggcctttag aaagaagacc aatttgcacg accatcagag aactcacact
2161 ggagagaaac cctatgcttg caaggagtgt gggagaaact tcagccggag ctccgccctt
2221 actaaacacc accgagttca cgcccggaat aaactgcagg aaagctaaac aatgggatgg
2281 ggaggaggca cggccgaaca tctgcttcca acccagtgtc agaggattct gaaagtctga
2341 gaatgtaatt atgtgtttgg aactgtgtga tagagaaaac tgccactaga agaaaaaat
2401 tttaaattaa agccattctt tcatacctta ttacaggctt cttgtagaac tacgtacggc
2461 atatgtagtc gtttggaat gatgtgacct tactaaagct tttgaatata tgtgtgcaga
2521 gtcaccaagt tttaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa
2581 aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaa

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(SEQ ID NO: 9)

Fig. 31

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1 maprpptakp qesvtfkdva vnftqeewhh vgpqrslyr dvmlenynhl vslgyqvskp
61 evifkleqge epwisekeiq rpfcpdwktr pessrspqgg vsevflrtnv lshttigdiw
121 nvaigqhges grrhlgpeas sqkkittlek kiegknvged sslstdlvpq ldisssirps
181 dcktfgnle hnselvtqsn ilakkkpykc dkcrksfihr sslnkhekih kgdpysngtd
241 qgaqsgkrhh ecadcgktfl wrtqltehqr ihtgekpfec nvvgkafhrs sslgqhenah
301 tgekpypqcs1 cgkafqrsss lvqhqrhtg ekpyrcnlcg rsfrhstslt qhevthsgek
361 pfqckecgka fsrccslvqh erthtgekpfc ecsicgrafg qspsslykhmr ihkrskpyqs
421 nnfslafvpn tlpqgegll tevksyhcnf cgkdfghitd fsehqrllhag ensygseqtl
481 lgqqs1shpr ekpyqcnvcg kafkrstsf1 ehhrhtgek pyecnecgea fsrlssl1tqh
541 erthtgekp1 ecidcgkaf1 qsssl1qher thtgekp1ec necgraf1rk1 tnlhdhqrth
601 tgekp1acke cgrnfsrssa ltkhhrvhar nklqes

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(SEQ ID NO: 10)

Fig. 32

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1 ctggcagcgg actttgaata gggaagtttt gcaggggtta cgcttgcaagt cagtcgcgtg
61 tttgcaaata ttgcgtgggc tggcgcgct gcgggctgcg ggaggggtccg gacccggcgt
121 ccgattgcag cgccatccag tttgcatgaa actttcacct gcgctcccgg gaacagtttc
181 tgctcggact cctgatcgtt cacctccctg ttttcccgac agcgaggact gtcttttcca
241 acccgacatg gatgtgctcc caatgtgtag catcttccag gaactacaga ttgtgcacga
301 aacgggctac ttctcggctc tgccgtccct ggaggaatat tggcaacaga cctgcctgga
361 gttggaacgc tatcttcaga gtgagccctg ctacgtgtca gcctctgaga taaaatttga
421 cagccaggaa gacctgtgga ccaaattcat tctagctcgg gagaagaagg aggaatcaga
481 actgaagatt tcttctagtc cccagaggga ctctctgata agctccagct ttaattataa
541 cttagagacc aatagcctga actctgatgt cagcagttag tcttcggaca gttcagagga
601 actttcaccc acgaccaa1t ttacctctga tccattgggt gaagtcttag tcaattcagg
661 aaatctgagt tcctccgtca tttccacacc tccatcttct ccagaagtga acagggaatc
721 ttctcaacta tggggctgtg ggccaggaga cctgccctca cctgggaagg ttcgaagtgg
781 gacctctggg aagtctgggtg acaagggtaa tggcgacgcc tccccagatg gcagaagacg
841 ggtacatcgg tgccacttta atggctgcag gaaagtttac acgaaaagct cccacttgaa
901 agcacatcag cgactcaca caggagaaaa gccttacaga tgctcatggg aagg1ttgtga
961 gtggcg1ttt gcaagaagtg atgagttgac cagacacttc cgaaagcata ccggtgccaa
1021 gcctttttaa tgctcccact gtgacagg1g tttctccagg tctgaccacc tggccctgca
1081 catgaagagg cacctctgaa ggagcagagg gacgaatcct gtaggctaaa agaggcttcc
1141 aggctaagag gcggccatgg aaggagggat gcctgtaaca gccaaagcat gccattttgc
1201 ttctatcca gttacctcca ggggcctctc tttggaagg1 cttttgagg1 ctacaaaagt
1261 catgtcagga gtggcatagc acccatgg1g catgg1gttt ggg1tgaccc1 ggactcacca
1321 ctgg1ttccta ac1ttctgag aggctctaag cttttggccg tgagcatgcg cactgagaat
1381 gttagtggg1t gggatgg1tg tgttgaggat ctattactga ctgtatgg1g aggcagactt
1441 tttttttctc ccc1tatgtg gtatcaaata actcgcggct gcag1cttta agaaatagaa
1501 atggcttcca aaagagctct ggtcatcctg gccaaaggag cag1cgacgc ggccgc

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(SEQ ID NO: 11)

Fig. 33

1 ggatgagaca gaaggataga gaggaggaga gagagagaga gaagagaagc aaccagaaat
61 aggcagccaa taaaaaggag ccgcacttat ctgaagcctc aaggggcctg agccagggtcc
121 ctgtttgatg gcagttatga aaaattacct cctcccgatc ctggtgctct ccctggccta
181 ctactactat tctacaaatg aagagttcag accagaaatg ctccagggaa agaaagtgat
241 tgtcactggg gccagcaaag ggattggaag agaaatggca tatcatctgt caaaaatggg
301 agcccatgtg gtattgactg ccaggtcgga ggaaggtctc cagaaggtag tgtctcgctg
361 ccttgaactc ggagcagcct ctgctcacta cattgctggc actatggaag acatgacatt
421 tgccggagcaa tttattgtca aggcgggaaa gctcatgggc ggactggaca tgcttattct
481 aaaccacatc actcagacct cgctgtctct cttccatgac gacatccact ctgtgcgaag
541 agtcatggag gtcaacttcc tcagctacgt ggcatgagc acagccgcct tgcccatgct
601 gaagcagagc aatggcagca ttgccgtcat ctctccttg gctgggaaaa tgaccagcc
661 tatgattgct ccctactctg caagcaagtt tgctctggat gggttctttt ccaccattag
721 aacagaactc tacataacca aggtcaacgt gtccatcact ctctgtgtcc ttggcctcat
781 agacacagaa acagctatga aggaaatctc tgggataatt gacgccctag cttctcccaa
841 ggaggagtgc gccctggaga tcatcaaagg cacagctcta cgcaaaagcg aggtgtacta
901 tgacaaattg cctttgactc caatcctgct tgggaaccca ggaaggaaga tcatggaatt
961 tttttcatta cgatattata ataaggacat gtttgtaagt aactaggaac tcctgagccc
1021 tggtgagtgg tcttagaaca gtccctgcctc atacttcagt aagccctacc cacaaaagta
1081 tctttccaga gatacacaaa ttttggggta cacctcatca tgagaaattc ttgcaacact
1141 tgcacagtga aaatgtaatt gtaataaatg tcacaaacca ctttgggcct gcagttgtga
1201 acttgattgt aactatggat ataaacacat agtggttgta tcggctttac ctcacactga
1261 atgaaacaat gataactaat gtaacattaa atataataaa ggtaatatca acttcgtaaa
1321 tgcaaaaaaa aaaaaaaaaa aaaaaaaaaa

(SEQ ID NO: 12)

Fig. 34

```

1 mavmknyllp ilvlflayyy ystneefrpe mlggkkvivi gaskgigrem ayhlskmgah
61 vvlrtarseeg lqkvvsrcll lgaasahyia gtmedmtfae qfivkagklm ggldmlilnh
121 itqtslsflh ddihsrvrrvm evnflsyvym staalpmlkq sngsiaviss lagkmtqpmi
181 apysaskfal dgffstirte lyitkvnvsi tlcvlglidt etamkeisgi inaqaspkee
241 caleiikgta lrksevydyk spltpillgn pgrkimeffs lryynkdmfv sn

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(SEQ ID NO: 13)

Fig. 35

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1 gagacggacg gtggccaccc caagacgcgc cccagcccgc catggcccgg atcctccggg
61 catcctgcct tctgtccctg ctccctggccg ggtttgttcc gccggggccgg ggacaagaga
121 agtctaagac agactgccat ggcggtatga gtgggtaccat ctacgagtat ggagccctca
181 ccatcgatgg ggaggaatac attcctttta agcagtatgc aggcaaatat atcctctttg
241 tcaacgtagc cagctactga ggtctgacag accaataacct tgaactgaat gcactacaag
301 aagaacttgg gccatttggc ttggtcattc tgggcttccc ttccaaccaa tttggcaaac
361 aggagccagg cgagaactcg gagatactcc ccagtctcaa gtatgttcca ccagggtgggg
421 gctttgtgcc taatttccag ctctttgaga aaggagatgt gaacgggggag aaagagcaga
481 aattctacac tttcctgaag aactcctgcc ctcccactgc agaactcctg ggctcacctg
541 gccgcctctt ttgggaaccc atgaagatcc atgacatccg ctggaaacttt gagaagtctc
601 tgggtggggcc agatggcata ccggttatgc gctggtacca ccggaccaca gtcagcaacg
661 tcaagatgga catcctgtct tacatgaggg ggcaggcagc cctgagcgcc aggggggaagt
721 aactgatgcc cccaccctac ccctaccccc tgcccacatc gcaagggccg agggggggct
781 cttcaggaag gaagccacat tcccagtcac tctaccccc ccccagattc tctttcttat
841 tacataaaaag acaagcctgg cacaactgtg tgtctgaacc actgtggaca cgtgacaatt
901 gtcccagtggt gtgcatggct acacagccac gtatctgcct gcttgaaacc cagggatggt
961 ccatctgtgt ttacggcttg gcacaacacc ctcatatttt tttcagcttt ctgttccaaa
1021 tgaagccaaa ggaaacacaa gttctaggtc caatggttct gctcaaacct gaacatcatt
1081 cttggggcca gcatctccca catgccaca ctacacacca ccagcctcct tcttccttcc
1141 tgaaggaccc tcctgagccc ccaagcccat cccacagtgc tcctgagacc agccaagaca
1201 actgtgagcg cgatggccgt gtaccccagg tcaggggtgg tgtctctatg aaggaggggc
1261 ccgaagccct tgtggggcgg cctcccctga gcccgctctg ggtgccagcc cttagtgcac
1321 tcaggcttag gctcccaggc agggacacta cccccgcgcc tctggaggac atgctatcct
1381 ctcaactctgt ccactggtat ctcaacaccc ccatctgccc agtaaaggtc tttctgc

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(SEQ ID NO: 14)

Fig. 36


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1 marilrascl lslllagfvp pgrgqekskt dchggmsgti yeygaltidg eeyipfkqya
61 gkyilfvnva syugltdqyl elnalqeelg pfglvilgfp snqfgkqepg enseilpslk
121 yvrpgggfvp nfqlfekgdv ngekeqkfyf flknsdppta ellgspgrlf wepmkihdr
181 wnfekflvgp dgipvmrwyh rttvsnvkmd ilsymrrqaa lsargk

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(SEQ ID NO: 15)

Fig. 37

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1 ctgtaaagcc cgcctcagc cccgccccct cgtccccgcc gccgcggggcc aagccggagc
61 aagctaggag gcagccggct ctgcggaggg aacatgtacc ggctcctgtc aagcgtgaca
121 gctcgggctg cggccaccgc aggccagcc tgggacggag gccgcgcggg ggcgcacagg
181 cgaccgggccc tgctgtgct gggccttggg tgggcccggc gcctggggct cgggctgggg
241 ctggctctcg gcgcgaagct ggtggtcggg ctgcggggcg ccgtcccat tcagtcccc
301 gcggaccccc aggcgtccgg cactaccgag ttatcgacg agcaggccct gagcccgggg
361 agcccgacaca cgcctgcgcc gccagcagcc aggggcttct ccagagccat cgagagcagc
421 cgcatctgct tacaccggat caaggatgag gttggtgccc ccggcatcgt ggttgaggtt
481 tctgtagatg gaaaagaagt ctggtcagaa ggtttaggct atgcagacgt ggagaaccgc
541 gtaccctgta agccagaaac ggtcatgaga atcgcaagca tcagcaaaag cctcaccatg
601 gtggctctgg ctaaactgtg ggaagcaggg aagctggatc tggaccttcc tgtgcagcac
661 tatgttcccc agttcccaga aaaagaatac gagggtgaaa aggtttctgt cacaacaaga
721 ttactaattt cgcatttaag tggaattcgt cattatgaaa aggacataaa gaaagtgaaa
781 gaagagaaag cttataaagc cctgaagatg gtgaaagggg ccccgccacc atctgaccaa
841 gaaaaagaac tgaaagaaaa gggaggcaaa aacaacgaaa agagcgacgc accgaaagcc
901 aaagtcgagc aggacagcga agccagatgc cgcagcgcgga agccaggcaa gaaaaagaat
961 gacttcgaac aaggcgaatt gtatttgaaa gaaaagtgtt gaaattcaat tgaatcacta
1021 agattattta aaaatgaccc tttattcttt aaacctggta gtcagttttt gtattcaacg
1081 tttggctata ctctgctggc agccatagta gaaagagctt caggatataa atatttggat
1141 tatatgcaga aaattttcca tgatttggac atgctgacaa ctgtccagga ggaaaacgag
1201 ccagtgattt acaacagagc aagattttac gtgtacaata aaaagaaaacg tcttgtcaac
1261 acaccttacg tggataactc ctataaatgg gctgggtggg gatttctgtc cacagtgggt
1321 gacctcctga aatttggaaa cgcaatgctg tatggctacc aagttgggca gtttaagaac
1381 tcaaatgaaa atctcttgcc tggatatctc aagccagaaa caatgggtgat gatgtggacc
1441 ccagtcacct acacagagat gtccctgggag aaagagggga aatatgcaat ggcgtggggg
1501 gtggtagaga agaagcaaac gtacggatcc tgcaggaagc agcggcacta cgcctcacat
1561 actggagggt ctgtgggtgc cagtgtgtc ctgctgggtc ttctgaaga actggactca
1621 gaggccgtaa ataacaaggt tccccacga ggaataatcg tctctatcat atgcaacatg
1681 cagtctgtgg ggctcaatag cactgctttg aagatcgctc tggaaattga taaagacaga
1741 gctgactaat cctaattggc gcacagggtc acagtgagcc ttccattctt tgaatgttg
1801 acgttcccaa atacataaac cttttaagga tacatttctg tcccaaatac ataaaccctt
1861 taaggataca tttgtaatag agtacagtta aatgtggaga attatgtacc tctaattgct
1921 taattttgta actgcctttt tattggacaa ttagttcttt acactcaggg aaataacagt
1981 tgtttctact ttttaaaaaa aatgtttact cttgaaataa aatcttctga t

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(SEQ ID NO: 16)

Fig. 38

1 myrllssvta raaatagpaw dggrrgahrr pglpvlglgw agglglglgl algaklvvgl
61 rgavpiqspa dpeasgttel sheqalslgs phtpappaar gfsrailessg dllhrikdev
121 gapgivvgvs vdgkevwseg lgyadvenrv pckpetvmri asisksltmv alaklweagk
181 ldldlpvqhy vpefpekeye gekvsvttrl lishlsgirh yekdikkvke ekaykalkmv
241 kgtppppdqe kelkekggkn neksdtpkak aeqdsearcr sakpgkkknd feggelylke
301 kfensieslr lfkndplffk pgsqflystf gytllaaive rasgykyldy mqkifhdldm
361 lttvqeenep viynrarfyv ynkkkrlvnt pyvdnsykwa gggflstvgd llkfgnamly
421 gyqvgqfkns nenllpgylk petmvmmwtp vpntemswdk egkyamawgv vekkqtygsc
481 rkqrhyasht ggavgassvl lvlpeeldse avnnkvpprg iivsiicnmq svglstalk
541 ialefdkdra d

(SEQ ID NO: 17)

Fig. 39

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1  aggctggnag ccacacttgg gaaaggaagc atggcgtgcg agctgcgagc tgtgttgctg
61  tggggccgcg ggctgcagac tgtactgcgg gccccgcgcg tggctggagt tcggcgagga
121 aagccagttc tgcaccttca gaagactaca gtccagttta ggggccccac acaaagtctg
181 gcttcaggga tctctgcagg acagttatac agcacacagg cagccgagga caaggaggag
241 gagagcctgc actccatcat cagcaacact gaggcagtgc ggggttctgt ctccaaacat
301 gagttccagg cagagacaaa gaaacttttg gacatcgtag cccgttctct gtactcagaa
361 aaagaggtgt tcatacgaga gctcatctcc aatgccagtg atgccttgga gaaactgcgg
421 cacaagctgg tgtgtgaagg ccaggtgctg ccagaaatgg agattcacct tcagacggat
481 gccaaagaagg gcactattac cattcaggac actggcattg ggatgacaca ggaggagctg
541 gtgtccaacc ttggcacaat tgccagatcg ggtcaaagg ccttcctgga agcactgcag
601 aaccaggcag agaccagcag caagatcatt ggtcagtttg gagtgggttt ctattcagcc
661 ttcattggtag ctgacaagg tgaagtctat tctcgatcag cagctccaga gagcccaggt
721 taccagtggc tttcagatgg ttctggagtg tttgaaattg ccgaagcttc aggagttaga
781 cctgggacca aaataatcat ccacctcaag tcagactgta aagattttgc cagcgagtcc
841 cgggtacaag atgtggtaac aaagtacagt aactttgtca gcttccccct gtaccttaat
901 ggaaagcgga ttaacacttt gcaggccatc tggatgatgg acccaaagga catcagtga
961 tttcagcatg aggaattcta ccgttatatt gctcaggctt atgataagcc ccgcttact
1021 ttgactaca agacggacgc accactcaac atccgcagca tcttctatgt gccagagatg
1081 aaaccatcca tgtttgatgt gagcagggag ctgggctcca gcgtggcact gtatagccgc
1141 aaggtcctca tccagaccaa ggctgcagac atcctgcccc agtggctgcg cttcattcga
1201 ggtgtggtgg atagtgagga cattccccctg aacctcagca gagagctcct ggagagtagt
1261 gcgctcatcc ggaaactccg ggatgttcta caacagagat tgatcaagtt cttcattgac
1321 cagagtaaaa aagatgctga aaaatacgca aagttttttg aagattatgg cttgttcatg
1381 agggagggca ttgtgaccac tgcagagcaa gacatcaagg aggatattgc aaaactgcta
1441 cggatgagt cctcagccct gcctgctggg cagctgacca gcttaccaga ctatgccagc
1501 cgaatgcagg ctggcacccg caacatctat tacctgtgtg cccctaaccg tcacctggct
1561 gaacattcac cctattacga agccatgaag cagaaacata ctgaggtgct cttctgctat
1621 gagcagttcg atgagcttac tctgctgcac ctgagggagt ttgacaagaa gaagctcatc
1681 tctgtggaaa cagacatcgt cgttgatcac tacaaggagg aaaagtttga ggacacatct
1741 ccagctgatg agcgctctc ggagaaggaa acagaagatc taatggcgtg gatgagaaat
1801 gcaactaggt cccgtgtcac caatgtgaag gtgactttcc gcctagacac ccacctgcc
1861 atggtgaccg tgctggagat gggggctgct cggcatttct tgcgtatgca gcagctggcc
1921 aagaccaggg aggaacgtgc ccaactgcta cagcccacac tggagatcaa cccagggcac
1981 aactgataa agaagctctg ccagctgagg gagagcgagc cggagctggc ccagctgctc
2041 gtggatcaga tctatgagaa tgccatgata gcagcaggac tcgttgatga cccccgggcc
2101 atggtcggcc gcctgaacga ccttttggtc aaggtcctgg agaaacactg acagccaaga
2161 cactggattht agtgtcaacc caggtcttct cgggtgataa tggacctgcc tggggaggga
2221 ggacttaata cacaacagt gccaccaact gcttgagctc agctttattht acttcaatta
2281 aacagtattht cttagtc

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(SEQ ID NO: 18)

Fig. 40

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1  acelravllw  grglqtvla  palagvrrgk  pvlhlqkttv  qfrgptqsla  sgisagqlys
61  tqaaedkeee  slhsiisnte  avrgsvskhe  fqaetkklld  ivarslysek  evfirelism
121 asdaleklrh  klvcegqvlp  emeihlqtda  kkgtitiqdt  gigmtqeelv  snlgtiarsg
181 skaflealqn  qatssskiig  qfgvgfysaf  mvadkvevys  rsaapespgy  qwlsdgsgvf
241 eiaaeasgvrp  gtkiiihlks  dckdfasesr  vqdvvtkysn  fvsfpflyng  krintlqaiw
301 mmdpkdisef  qheefyryia  qaydkprftl  hyktdaplmi  rsifyvpemk  psmfdvsrel
361 gssvalysrk  vliqtkaadi  lpkwlrfrir  vvdseidpln  lsrellqesa  lirkldravlq
421 qrlikffidq  skkdaekyak  ffedyglfmr  egivttaeqd  ikediakllr  yessalpagq
481 ltslpdyasr  mqagtrniyy  lcapnrhlae  hspyyeamkq  khtevlfcye  qfdeltllhl
541 refdkkkkis  vetdivvdhy  keekfedtsp  aderlseket  edlmawmrna  lgsrvtnvkv
601 tfrldthpam  vtvlemgaar  hflrmqqlak  tqeeraqlq  ptleinprht  likklcqlre
661 sepelaqlly  dqiyenamia  aglvddpram  vgrlndllvk  vlekx
```

(SEQ ID NO: 19)

Fig. 41

```

1  ctccgcgtcc gccccgccac cgtgccagcc atggagcccc gagccccccg ccgcccagac
61  acccaccagc gcggtctacct gctgacgcgg gaccgcgcatc tcaacaagga cttggcctttt
121 actctggaag agagacagca gttgaacatt catggattgt tgccgccttg catcatcagc
181 caggagctcc aggtccttag aataattaag aatttcgaac gactgaactc tgacttcgac
241 aggtatctcc tgttaatgga cctgcaagac agaaatgaga agctcttcta cagcgtgctc
301 atgtctgatg ttgaaaagtt catgcctatt gtttacaccc ccaccgtggg cctcgcatgc
361 cagcagtaca gtttggcatt ccggaagcca agaggcctct ttattagtat ccatgacaaa
421 gggcacattg cttcagttct taatgcatgg ccagaggatg tcgtcaaggc tattgtggta
481 actgatggag agcgcacacct tggcttggga gaccttggct gtaatgggat gggcatccct
541 gtgggtaaac tggccctgta cacggcatgt ggaggggtga acccacaaca gtgtctaccc
601 atcacttttg atgtgggaac agaaaatgag gattactta aggatccact gtacatcggy
661 ctgcggcacc ggcgagtcag aggcctgag tatgacgcct tcctggatga gttcatggag
721 gcagcgtctt ccaaatatgg catgaattgc cttattcagt ttgaagattt tgccaatcgg
781 aatgcatttc gtctcctgaa caagtatcga aacaagtatt gcacatttaa cgatgatatt
841 caaggaacag cgtctgttgc ggttgccggg ctcttgcag ctcttcgaat aaccaagaac
901 aagctctctg atcagacagt gctgttccag ggagctggag aggtgcctt ggggattgct
961 cacttggttg ttatggccat ggagaaagaa ggtttatcaa aggagaatgc tagaaagaag
1021 atatggttgg ttgactcaaa aggactaata gttaagggtc gtgcatctct cacagaagag
1081 aaagaggtgt ttgcccatac acatgaagaa atgaagaatc tggaagccat tgttcaaaag
1141 ataaaaccaa ctgccctcat aggagtgtg gcaattgggtg gtgctttcac tgaacaaatt
1201 ctcaaggata tggctgcctt caacgagcgg cccatcatct ttgctttgag taatccgacc
1261 agcaaagcgg agtgctctgc agagcagtgc tacaagggtg ccaagggacg tgcaatcttt
1321 gccagcggca gtccttttga tccagtcact ctcccagatg gacggactct gtttcctggc
1381 caaggcaaca attcctacgt gttccctgga gttgctcttg ggggtgggtg ctgcggaactg
1441 agacacatcg atgataaggt cttcctcacc actgctgagg tcatatctca gcaagtgtca
1501 gataaacacc tgcaagaagg ccggctctat cctcctttga ataccattcg aggcgtttcg
1561 ttgaaaattg cagtaaagat tgtgcaagat gcatacaaag aaaagatggc cactgtttat
1621 cctgaacccc aaaacaaaga agaatttgc tctcccaga tgtacagcac taattatgac
1681 cagatcttac ctgattgtta tccgtggcct gcagaagtcc agaaaataca gaccaaagtc
1741 aaccagtaac gcaacagcta ggatttttaa ctttattagt aaaatcttga agttttcatg
1801 atctttaagg gtcagaatct tttatgatga ttcatagtgt gcttagaata aggtgatttt
1861 agtttaataa caaactcatg ggagtctatt aggataaatt aggataaatt tcacaccaga
1921 cggttttgtt tcacttactg tggatattta tgttttctct tgtgattatt ctctttatga
1981 attctgttta aaagctactg tacctgctgc tgagaaagtc ctcactgata tgtaggaagc
2041 taatggaaga cccacactag taataaatta atatagcata acttgattac atttaatgcc
2101 tacagttctt tcttgactat tttgctaaaa tctcttaaac agaaaagata aacacaaact
2161 tgggtatagc tgaactttta ctaaacagaa gactactttt gttgcctaga gaaaatcttc
2221 tcaggacttt tattccaggc ctcggttagc tttgttctct ttgtacacct gactcaaac
2281 ctctgagaaa gctcactgct gtttacagta ccctgcgtag ccttagctca tcagcgtctt
2341 ctgtcgttgt tatgttatat cccatagagt agagctctcg tcccaaaca ctccatagaa
2401 acaccctttc tcatctctga gcaaccctg gcctgctga gatactcggg tgtttttgtt
2461 agtgtagcct gggcagttag aagggtgca ggggggtcct tgagacgggg ccctgggaac
2521 ccacctctga gacaagggag tcagatgcca gacagtgggt ccagacaag ctcaggctcc
2581 atgaagatca cctgctctaa tgtccctgtg cttagttcgg aggactgaga gctcatggca
2641 tgagtaaata catctcta gctaccttt ctatcagata taaaatatg ttaattacca
2701 aaaccattct ctgagaaaaa aaaaacagc cttcccagg tggattaat ttactggaca
2761 cgttgataat ggcatgacta gaaacagcct taactcctaa gctcagggtt aagaacattc
2821 tgtgtatcta gagactcctg actttgaagt tgctttaaa cctgtgtggg tttgcggcgg
2881 gcagctctgt acagtgagct ccttgaaggt gaggtgcag aagctttcag gtgtgagcta
2941 aaagggtaca gacttcctaa tgacaacttg tgactaacgg tttcttcagt gtagttattt
3001 gagaaagatt cagaatttct atcttttctt gtatgtttcc atgtgtcag gtagttgtaa
3061 atgaatgtat ttacctatgc aaaagattta taaagccta gagaat

```

(SEQ ID NO: 20)

Fig. 42

```
1  ttccccgogct tctgctccgc cctccgcagc cctccacagt caccgccggag accagccgtg
61  ttaagctctc tgctctgaag ctgactgact tccatggcag ccgcgaagaa agcagttctg
121 gggccattgg tgggagcagt ggaccagggt accagctcga cacgtttttt gggttttcaat
181 tcaaaaacag ctgaacttct tagtcatcat caagtagaaa taaaacagga attcccaaga
241 gaaggatggg tagaacaaga cccgaaggaa attctgcagt ctgtttatga gtgtatagag
301 aaaacgtgtg agaaacttgg acagctcaat attgatattt ccaacatcaa agccattgggt
361 gtcagcaacc agagggaac cacagtagtc tgggacaagg tcaccggaga gcctctctat
421 aatgccgtgg tgtggcttga cctaagaacc cagtctactg ttgagaacct tagtaaaaga
481 attccaggaa ataataactt tgtcaagtcc aagacaggcc ttccacttag cacgtatttc
541 agtgcagtga aacttcgttg gtccttgac aacgtgaaaa aggtccaaga ggctgttgaa
601 gaaaatagag ctcttttttg gaccattgat tcatggctta tttggagttt aacaggagga
661 atccatgggg gtgtccactg tacagatgta acaaatgcaa gcaggacgat gctttttaac
721 attcattctt tgggaatggga taaagagctc tgccaatttt ttggaattcc aatggaaatt
781 cttcccaacg ttcggagttc ttctgagatc tatggcctaa tgaaagctgg ggccttgga
841 ggtgtacca tatctgggtg tttgggggac cagtctgctg ctttgggtgg acaaatgtgc
901 ttccaggatg gacaggccaa aaacacgtat ggaacagggt gcttcttatt gtgcaacacg
961 ggccataagt gtgtattttc tgaacatggc ctctgacaa ccgtagcata taaacttggc
1021 agagacaaac ctgtgtatta tgcgttgga gggtccgtgg ctatagctgg tgctgtaatc
1081 cgctggctaa gagacaacct tgggaattatt aagtcctctg aggaaattga aaaacttgct
1141 aaggaagtag gtacttctta tggctgctac ttcggtccag cattttcagg gttatatgcg
1201 ccttattggg agcccagtcg aagaggatc atctgtggac tcactcagtt caccaataaa
1261 tgtcatatcg cttttgctgc actagaagct gtttgtttcc aaacccgaga gattttggat
1321 gccatgaatc gcgactgtgg aattccactc agtcatttac aggtagatgg aggaatgacc
1381 agcaataaaa ttcttatgca gctacaagca gacattctgt atattccagt agtgaaaccc
1441 tccatgcctg aaacaactgc actaggcgct gccatggcag ctggggctgc agaggggggt
1501 ggtgtgtgga gtcttgaacc tgaggatttg tcagctgtca caatggagcg gtttgaacct
1561 cagatcaatg ctgaagaaag cgaaatccgt tactccacat ggaagaaagc tgtgatgaag
1621 tcaattgggt ggggttacaac tcagtcctca gaaagtggta tcccataaat aataccacct
1681 cacggatttc caagatgcaa gctttttaat gtgatatgaa aatctgacta ttctgtctca
1741 tagtataatg atgctattca tagactctga ttttttcat aagccactgg ctgcatgac
1801 ctctaagcag acctatgact tgaaataaag aaagtgcagc agaaagaatc ctccagaaac
1861 atttaatttt tttttaacat tgacagttaa gatcgggtca gtcaccttg aggctgacct
1921 ctgcctccac tgtcatgatg tcctacacta ttcccgttaa ggtctagggt gattttggta
1981 tctgtctat tgaaatgtgc cattcagtat attcagatgc tagtggatta cacatgtttg
2041 aggaagagggt tgttactaac ctgttcaaaa tgagtggctt cttgcttgtt tgcttttaac
2101 agctcagatg tcttcttttc tatatattag aaggccacaa cattactgga tatttcaaat
2161 ggaaacatct aaagaattgt tggataattg aatttgctaa ttcttggtgg ttaagacatt
2221 tttctgtaca gttgtttgcc caaaattcca acctgtcag gtgttttaca ctgtccact
2281 aactaccata gctttctgtc tggctcttac aggatagaac actttctttt tctgcttttt
2341 tttcatttct cctttttata tttttattct gtatgtataa catacatgcc tatatatttt
2401 atatgctgag agtaacccat ttataaatta agagcacatt atattcaata agttataaga
2461 gggctggtct taagtggact actatgtata cag
```

(SEQ ID NO: 21)

Fig. 43

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1 maaakkavlg plvgavdqgt sstrflvfns ktaellshhq veikqefpre gwveqdpkei
61 lqsvyeciek tceklgqlni disnikaigv snqrettvww dkvtgeplyn avvwldlrtlq
121 stvenlskri pgnnnfvksk tglplstyfs avklrwlldn vkkvqeavee nralfgtids
181 wliwsltggi hggvhtcdvt nasrtmlfni hslewdkelc effgipmeil pnvrrsseyi
241 glmkagaleg vprisgclgdq saalvggmcf qdggakntyg tgcflcntg hkcvfsehgl
301 lttvayklgr dkpvyyaleg svaiagavir wlrdnlgiik sseeieklak evgtsgygyf
361 vpafsglyap ywepsargii cglqtqftnkc hiafaaleav cfqtreilda mnrdcgipls
421 hlqvddgmts nkilmqlgad ilyipvvkps mpettalga maagaaegvg vwslepedls
481 avtmerfepq inaeeseiry stwkkavmks igwvttqspe sgip

```

(SEQ ID NO: 22)

Fig. 44

```

1 tgtcagactc tgcatttctc ctccactccc tccctccgagg aattctgcgc cctgtaactg
61 ttctgccctc ccctttaaag gttgacttgc cctacggcgc tccaccgcgc tccagtcctc
121 ttgcgcctcc tgctcaaccc gctcctgact gccccacgcc gcgtagttcc agcagcaaa
181 cagaaggggtg caccgggaga tggagagcaa agccctgctc ctgggtgggtcc tgggagtttg
241 gctccagagt ttgaccgcct tccgaggagg ggtggccgca gcagacgcag gaagagattt
301 ctcagacatc gaaagcaaat ttgccctaag gaccctgaa gacacagctg aggacacttg
361 tcatctcatt cctggattag cagactctgt gtctaactgc cacttcaacc acagcagcaa
421 gaccttcgtg gtgatccatg gatggacggg aacgggaatg tatgagagtt ggggtgccccaa
481 acttggtggcc gccctgtaca agagagaacc tgactccaat gtcattgtag tagactgggtt
541 gtatcgggcc cagcaacatt atccagtgtc agctggctac accaagctgg tgggaaatga
601 tgtggccaga ttcatacaact ggatggagga ggagtttaag taccctctag acaacgtcca
661 cctcttaggg tacagccttg gagcccatgc tgctggcgta gcaggaagtc tgaccaataa
721 gaaggtcaat agaattactg gtttggatcc agctgggcct aactttgagt atgcagaagc
781 cccagtcgc ctttctcctg atgacgtgca tttttagat gtcttacaca catttaccag
841 ggggtcacct ggtcgaagta ttgggatcca gaaaccagtg gggcatgttg acatttatcc
901 caatggaggc actttccagc caggatgcaa cattggagaa gccatccgtg tgattgcaga
961 gagaggactc ggagacgtgg accagctggg gaagtgtctg catgagcgct ccattcatct
1021 cttcattgac tccctgctga atgaagaaaa cccagcaaaa gcatacaggt gcaactccaa
1081 ggaagccttt gagaaagggc tctgcctgag ttgtagaaag aatcgctgta acaatctggg
1141 ctatgagatc aacaaggtca gagccaagag aagcagcaag atgtacctga agactcgctc
1201 tcagatgccc tacaaagtgt tccattacca agtcaagatt cacttttctg ggactgagaa
1261 tggcaagcaa cacaaccagg ccttcgaaat ttctctgtac ggcacagtgg ccgagagcga
1321 gaacattccc ttcaccctgc ccgaggttcc cacaataaaa acctactcct tcttgattta
1381 cacggagggtg gacatcggag aactgctcat gatgaagctt aagtggatga gcgactccta
1441 cttcagctgg cccgactggg ggagcagccc cagcttcgtc atcgagagga tccgagtga
1501 agccggagag actcagaaaa aggtcatctt ctgtgctagg gagaaagttt ctcatctgca
1561 gaagggaaaag gactcagcag tgtttgtgaa atgccatgac aagtctctga agaagtctgg
1621 ctgacactgg acaaacaaac aagagaagaa agcatccgag ttctttgaag acagaagaaa
1681 acaaagtaaa ttttaatttaa aaaaataata cccttgtttg ggtgtttgaa agtgggtttt
1741 cctgagtatt aatcccagct ctatcttggt agttaacag aagacagtct caaatattaa
1801 acgggtggcta acccaggggt aggaatctaa tggcccatag caggctctcc agcatcagaa
1861 gacatcaggc aggagaaaca tgctgtcttg tatcccttaa gaaggaatca tttgttccca

```

Fig. 45A

```
1921 acaatataag actccatcat gtgacccatt tggatcatggt ctaaaattag taagaactct
1981 gaggttttat attgagacct tttcaaagtt ttctcaaagt ctaatataga caatatTTTT
2041 tgtggcatga gtcagggtcca tttcttttagc ggttgaaaca cctggccttt gcaactagtt
2101 tttttttacc attgggatat attcccccca ccaaaaaaaaa aaaaaaaaaa aagtaaccag
2161 gaacgtgtga cttggcaaaa gcagttgaag acatgggtca tgaagtccctg acccttgggtc
2221 ccaccacaac aaagtacaag tcaacagaga taaaaaacct agactgagta attcttaata
2281 gacttgaatt tttatggctt aatccttcta tcttttaaat atttgtcaga tattttaaca
2341 ttgttctctg gatagatgtt gaaaatgagc ttataagctg ggcaatgggtg gcgctcacct
2401 ttaatccag cacttggcag gcagaggcag gcgattttct gagttcaagg ccagcctgggt
2461 ttacagagtg agttccagga catccagagc tacacagaga aaccctgtct cgggaaaaaaa
2521 aaaaaaaaaa aagaagaagg agaagaagg ggagggaggg agggaggagg ggagggaggg
2581 aggaaggaag gaaggaagga aggaaggaag gaaggaagga aggaaggaag gaagaaagaa
2641 agaaagaaag aaagaaagaa agaaagaaag aaagaaagaa agaaagaaag aaagaaagaa
2701 aatgagcttg taattgaggt gacacataaa ttttgtctgaa agacaaaaat gcctaggttg
2761 attttacttc tcttttttgc tttcttga aaagtcacaa ttgtcccatg ctgtaaccaa
2821 gtctggccta gaactaaact atgtatttca ggctggcctt gaactctcaa ccatcctgcc
2881 ttagcttcct gtgtcctggg agcttgagaa ccgtaatttt attatcagat tttcttact
2941 tgttttcatc aatttgaaat gcccaatatc caatactttg tatttcattt gagactcatc
3001 tccgccatgc ctctgtcaca cttctaacac atcacattaa tttctagttt agatgtgatc
3061 aagttcaaat tctgcaactgt gcaaagtaca agtttttagag caggaccatt ttttttatca
3121 cataaaagtt gaaattacta gaaaatgtgc atatggatgc ttgtaaactg ctgtgcaaag
3181 agaagagccc tcaactgtaa tagctataga aagtaccagg attgttgccg ctgttttgtt
3241 ttaccttaac aacaacaaca acaaaaatca ataatgaaga attatttatg aacgagatct
3301 cacattttca gattgctttt attattcatt aatgtaaaat gataaagaag atctatctca
3361 gaggttatag ctgggagcag aaactgtgaa atttgtgggt atctgaacac caaccacat
3421 gcaaaacccc acaagtgtag tcgtcattca atgtgattca gaaaggaaag agtcaaggga
3481 tatactggaa tatgttagag aagtagttcc agatatgctg gaatgttagc ccttgctagg
3541 agaaagctgg ttgtgcctat gtaatatagg acaaagggtg ccgatttcat caagtttggg
3601 gtcaattcta acaataaaaa tatgtataat ttgttaccgg catccccatt attgctaatt
3661 cattacagta tatacacatc catgcataca tatgtcaatg atgcttttagc tttcaattta
3721 tttattagct gtaaataatg tgtgggtatg taagaatgct tgtaaacact ggaaagtctg
3781 ttgtgggttat ctgcagtata gatttgtggg gctaactttg tgtccgtctc catccatgat
3841 tgtctgtctc actgagccaa cttaactctg atgaaacagt acaatgaaat aggcttttga
3901 aagaagaaaa ctcacctgtg tgaagaaatg gtatctgctt tcaataaaac tgagaacatt
3961 ttatcatga
```

(SEQ ID NO: 23)

Fig. 45B

1 meskalllvv lgvwlqslta frggvaaada grdfsdiesk falrtpedta edtchlipgl
61 adsvsnchfn hssktfvvih gwtvtgmyes wvpklvaaly krepsdnviv vdwlyraqqh
121 ypvvsagytkl vgnndvarfin wmeeeefnypl dnvhlhgysl gahaagvags ltnkkvnrit
181 gldpagpnfe yaeapsrlsp ddadfdvdlh tftrgspgrs igiqkpvghv diypnggtfq
241 pgcnigeair viaerglgdv dqlvkcsheh sihlfidsl1 neenpskayr cnskeafekg
301 lclscrknrc nnlgyeinkv rakrsskmyl ktrsqmpykf fhyqvkihfs gtengkqhnq
361 afeislygtv aesenipftl pevstnktys fliytevdig ellmmklkwm sdsyfswpdw
421 wsspsfvier irvkagetqk kvifcarekv shlqkgkdsa vfvkchdksl kksq

(SEQ ID NO: 24)

Fig. 46

Identification of disease subtypes allows for identification of causal targets for each

subtype

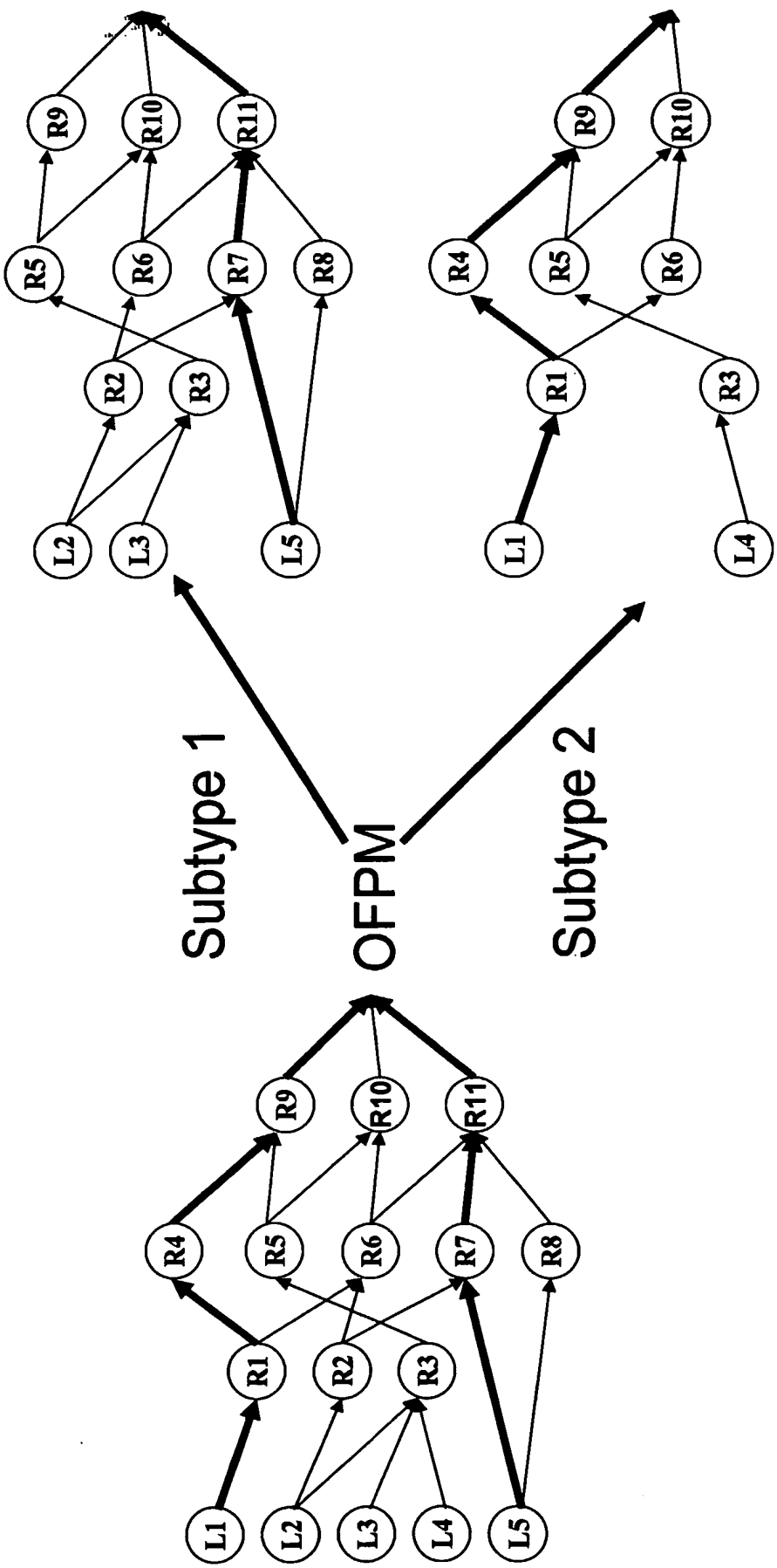


Fig. 47

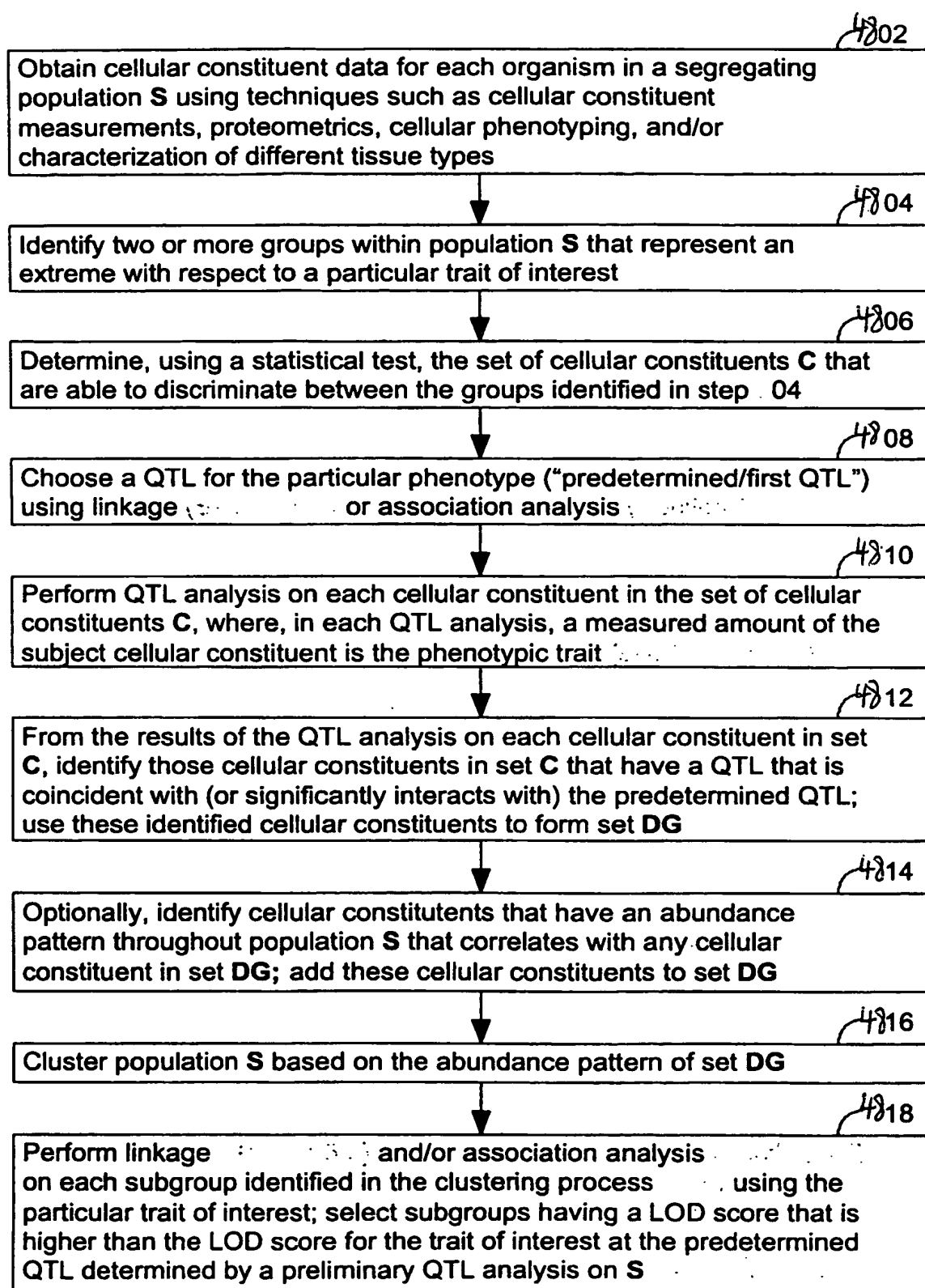


FIG. 48

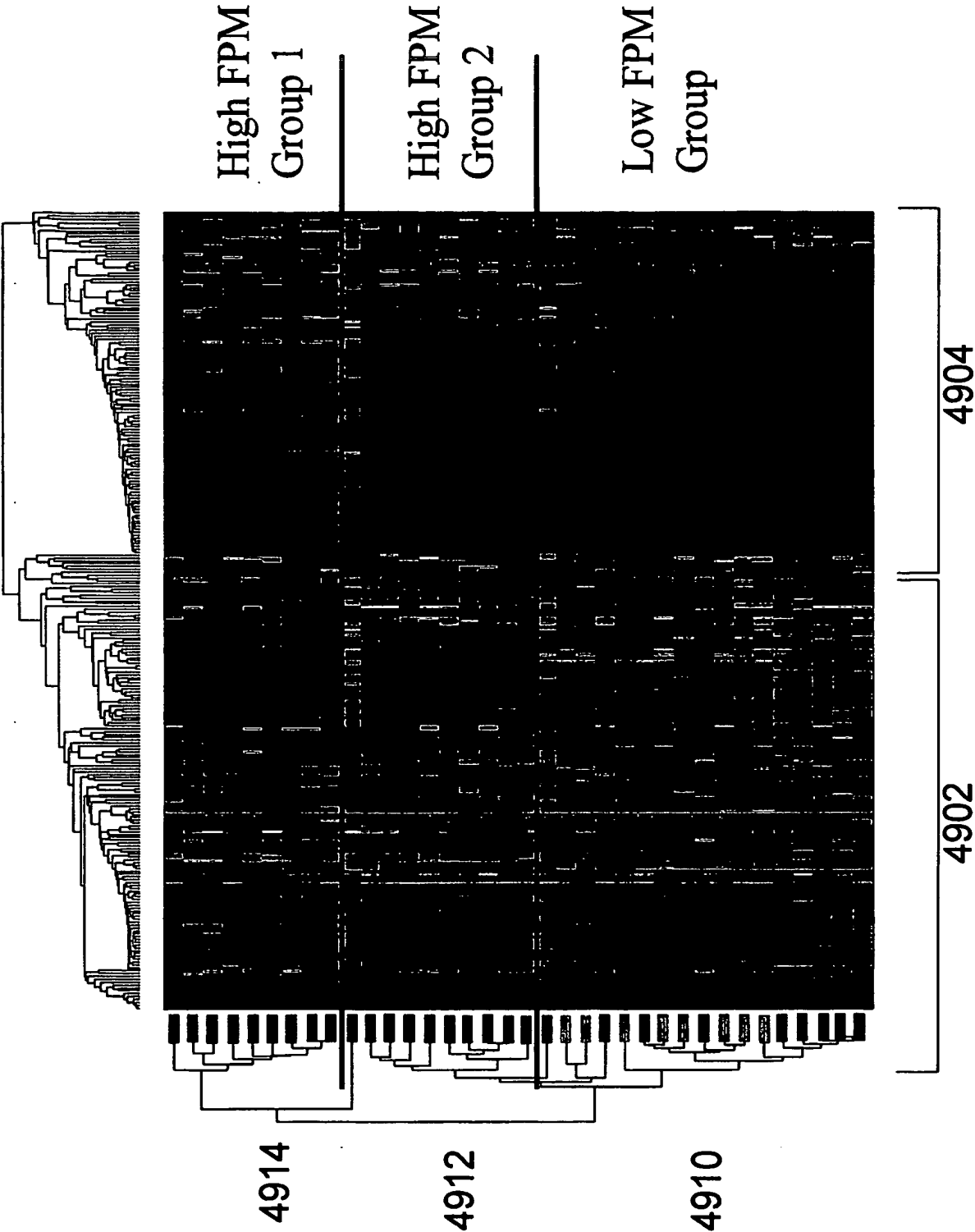


Fig. 49

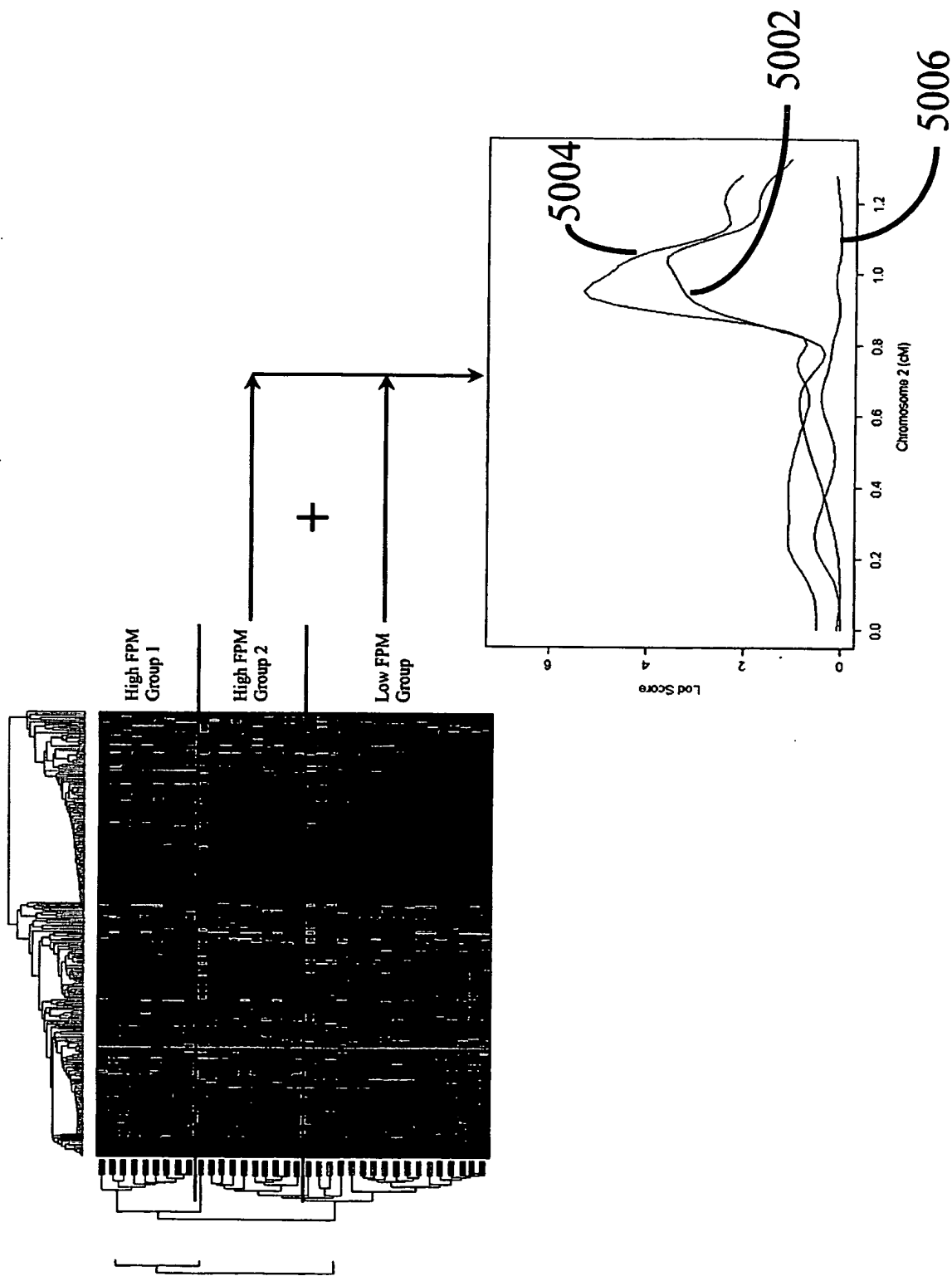


Fig. 50

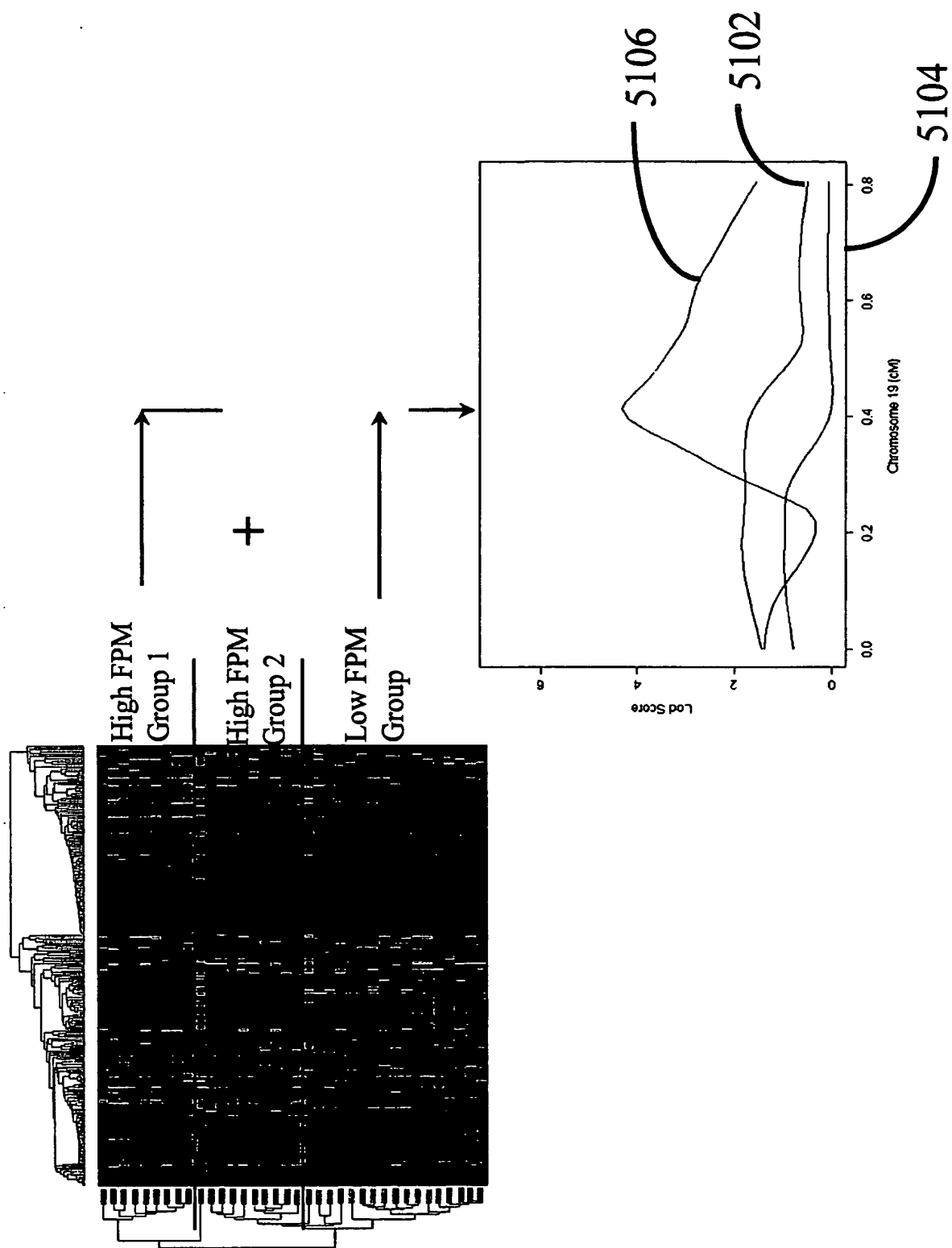


Fig. 51

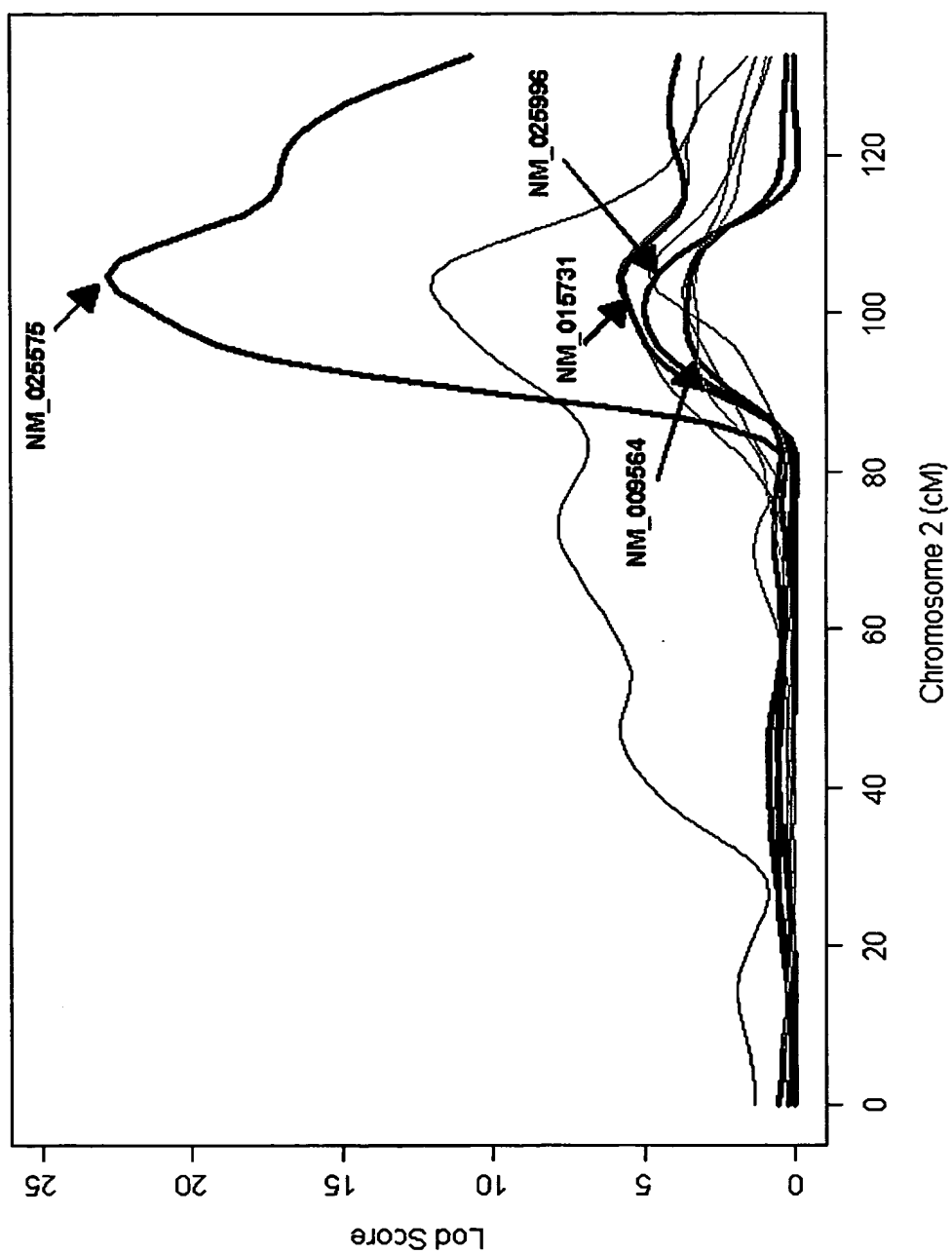


Fig. 52

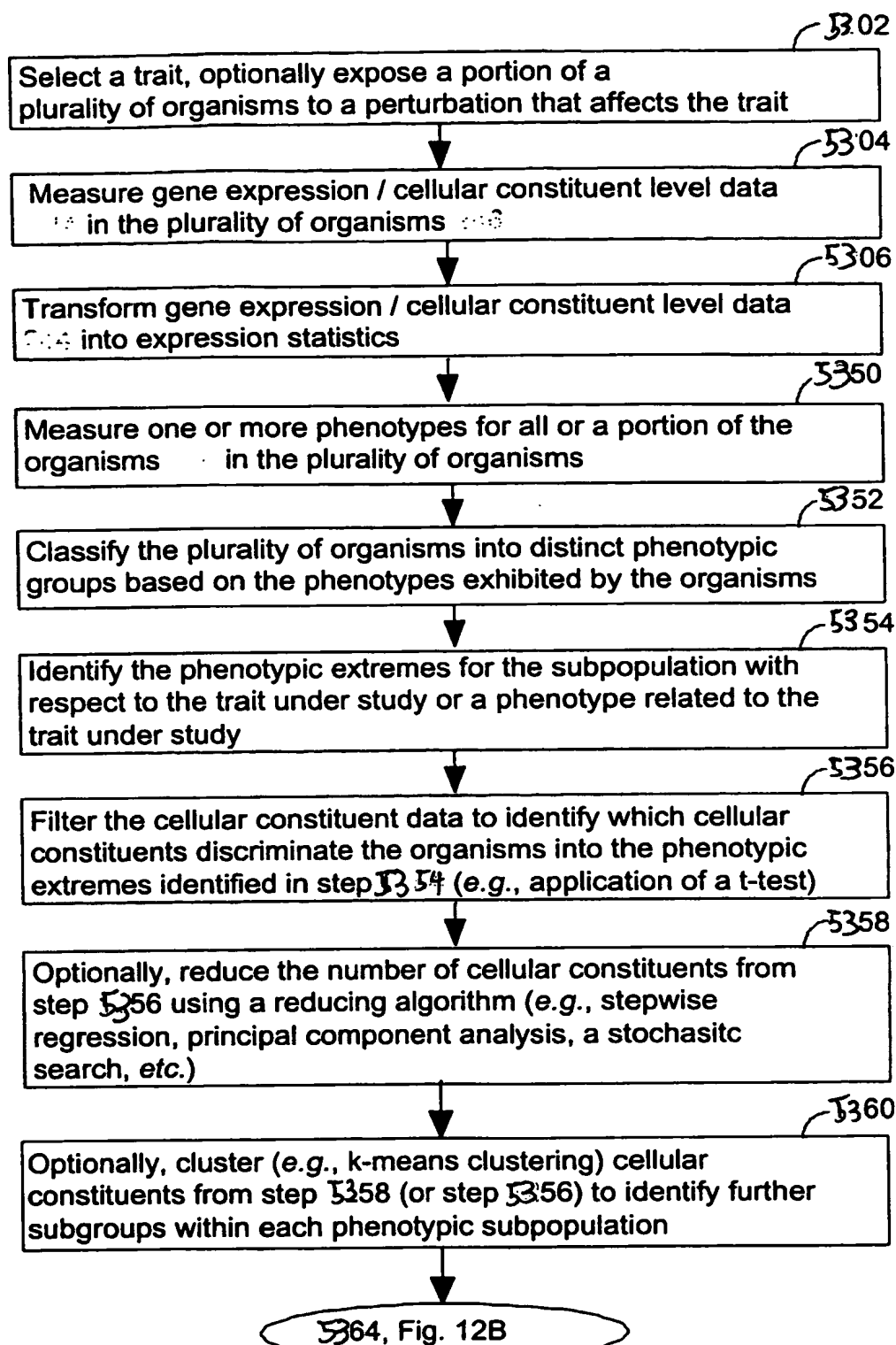


FIG. 53A

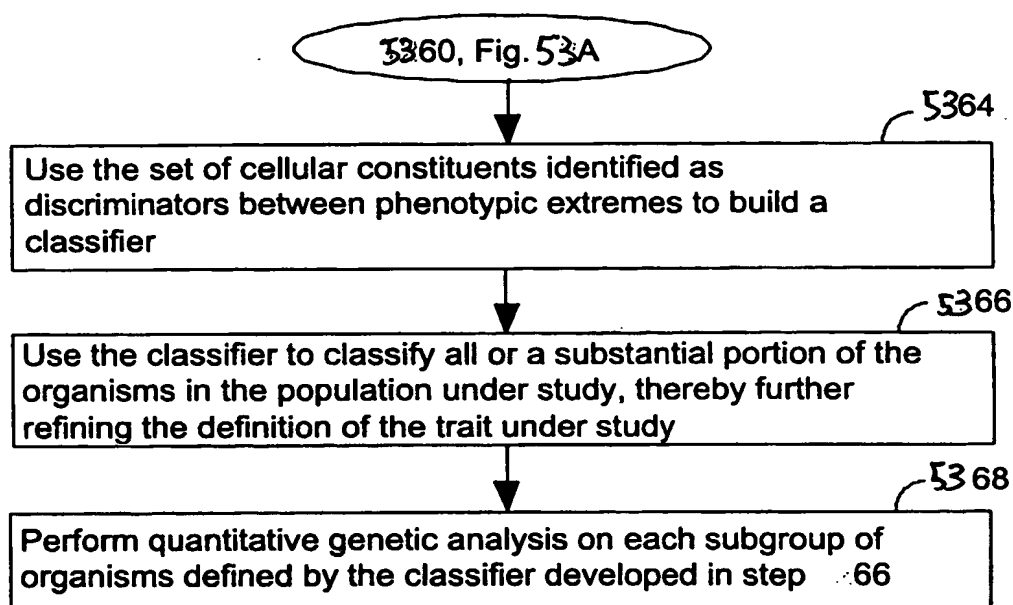


FIG. 53B

	Phenotype 1	...	Phenotype M	CC 248-1	...	CC 248-Z
Organism 146-1	Amount 1301-1-1	...	Amount 1301-1-M	Level 250-1-1	...	Level 250-1-Z
Organism 146-2	Amount 1301-2-1	...	Amount 1301-2-M	Level 250-2-1	...	Level 250-2-Z
⋮	⋮	⋮	⋮	⋮	⋮	⋮
Organism 146-N	Amount 1301-N-1	...	Amount 1301-N-M	Level 250-N-1	...	Level 250-N-Z

FIG. 54

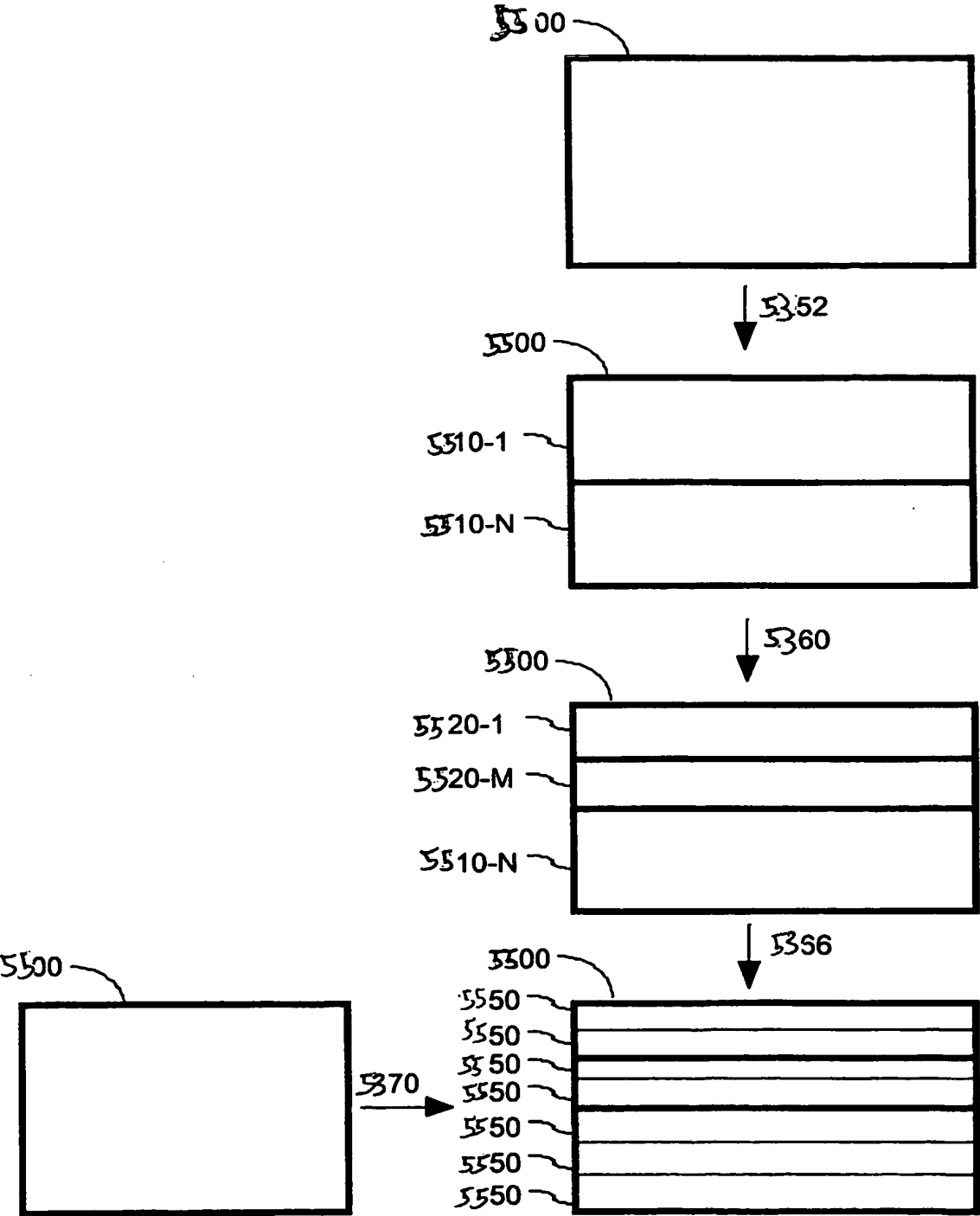


FIG. 55

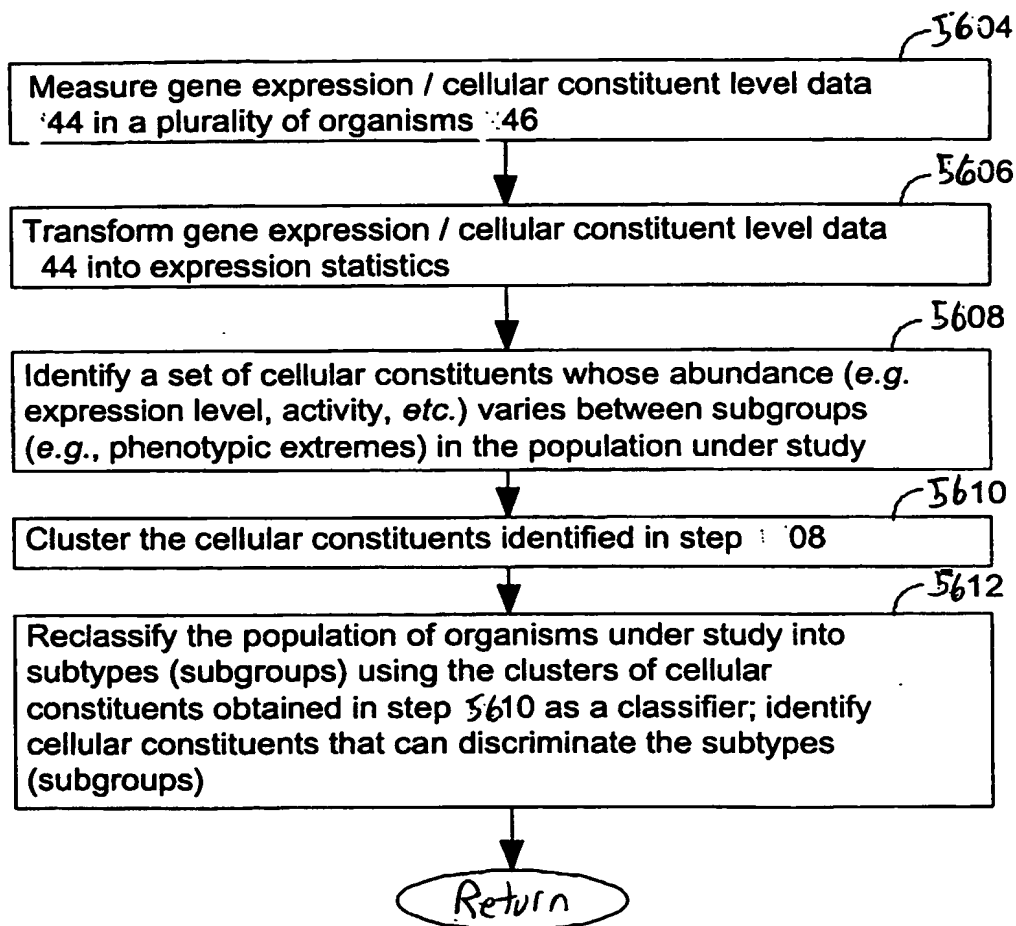


FIG. 56

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